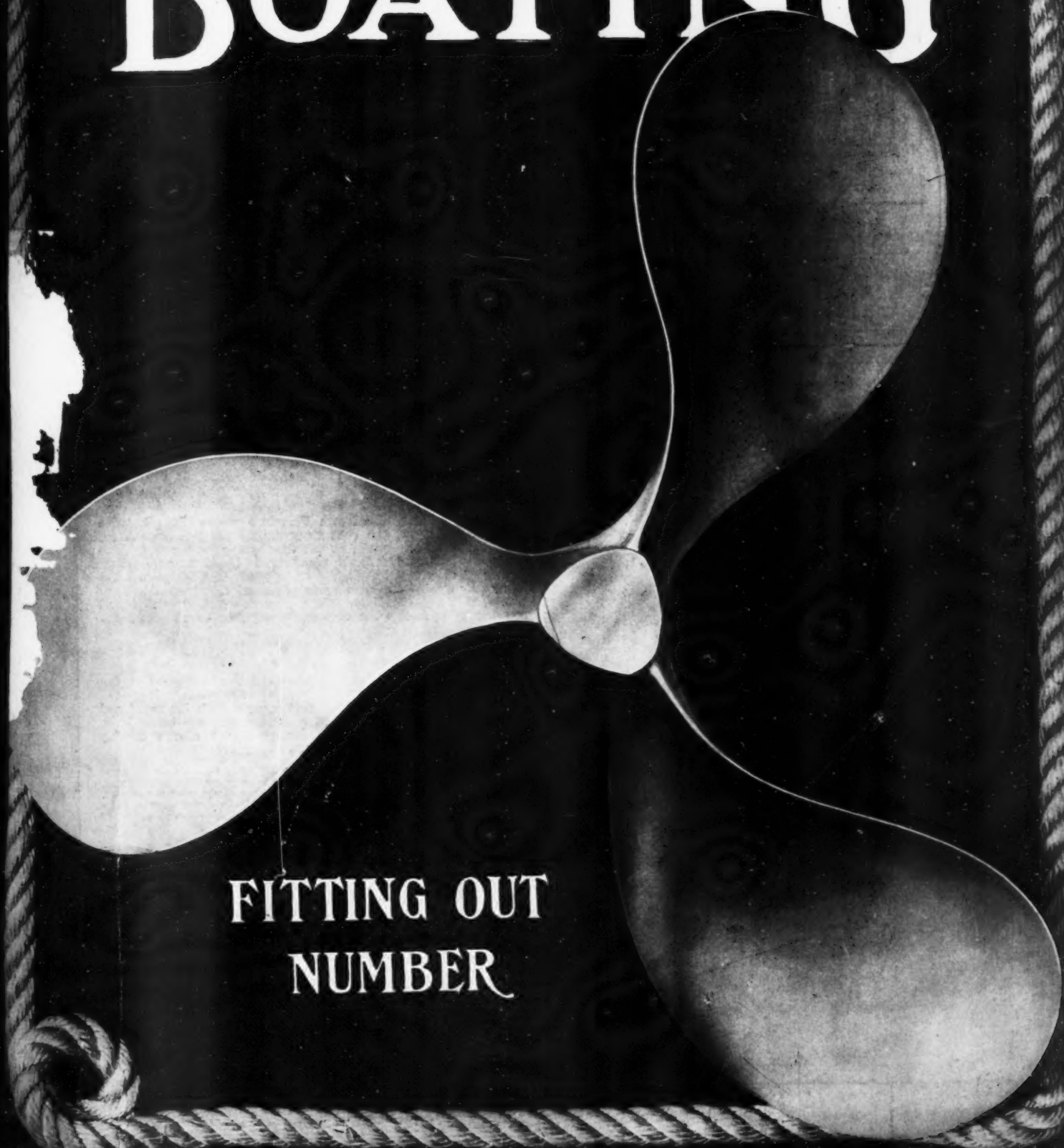


APRIL
1911

MOTOR BOATING

25
CENTS

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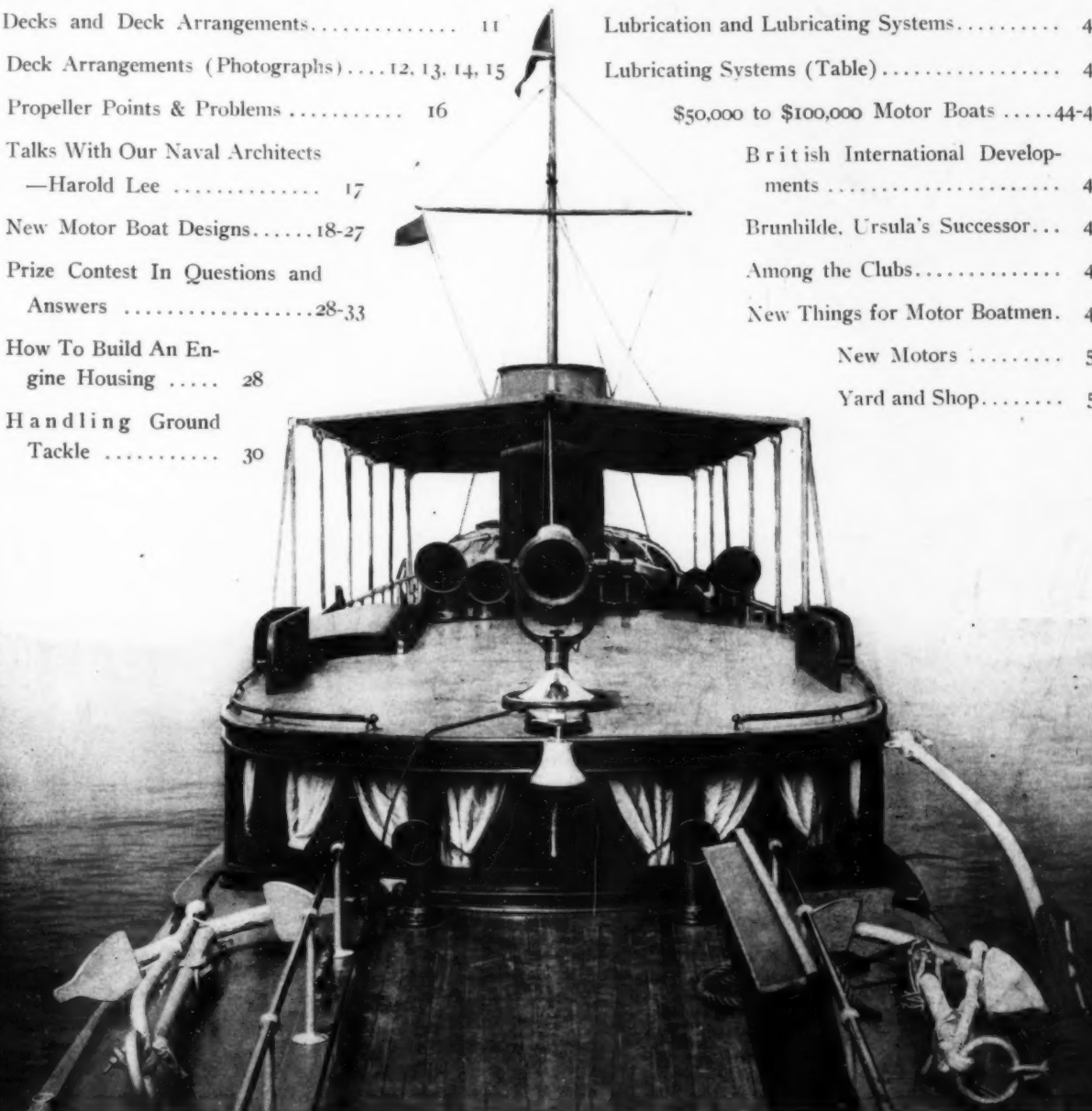
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The National Magazine
April, 1911.

**MOTOR
BOATING**

of Motor Boating
Vol. VII. No. 4.

Entered as second-class matter at the New York, N. Y., Post Office.

Published Monthly by NEW PUBLICATION COMPANY, 381 FOURTH AVENUE, NEW YORK CITY

G. L. Willson, President

George von Utiassy, Treasurer

C. J. Shearn, Secretary

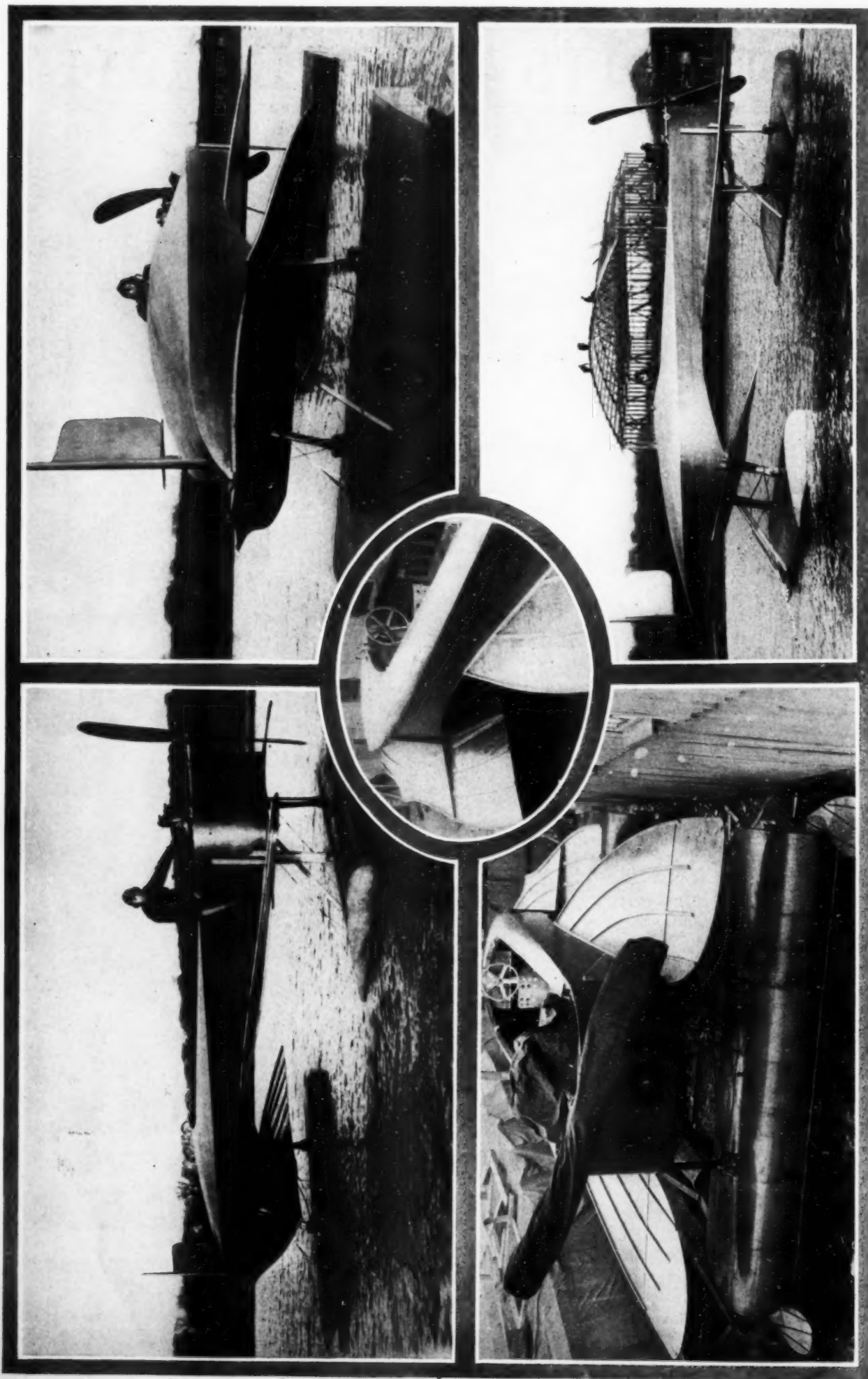
Telephone: 7100 Madison Square

Cable Address: Motoria

25 cents a copy. Subscription, \$1.00 a year.

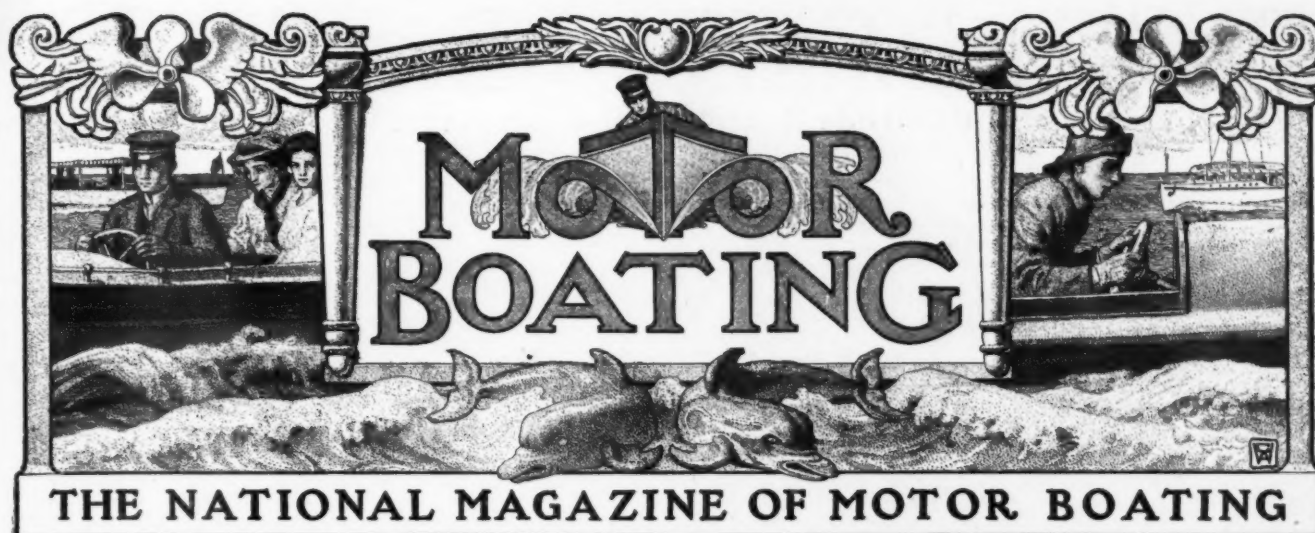
Canadian Postage, 50 cents; Foreign Postage, \$1.00.

European Agents: Saabach's News Exchange, Mainz, Germany.



The latest in aero-hydroplanes.

This weird looking craft is not the product of a disordered imagination, as one would likely conclude from a casual glance, but an aero-hydroplane. It was designed by M. Ravaut, a French aviator, and was built recently by Samuel Saunders at East Cove, England. The hull consists of two hydroplane floats, each about two feet long, supporting the body by means of struts. The body is equipped with three aerial planes, a large one at the bow and one on either side of the stern, which are intended to aid the planes, on the under sides of the floats, in lifting the hull, in order to overcome the resistance and friction of the water. The rudder is an aerial one placed at the bow, and the motor, a 50 h. p. Gnome, drives an aerial propeller at the stern.



The New York to Halifax Race.

The Proposed Reciprocity Race to Nova Scotia, for the William Randolph Hearst Trophy.
Advantages of the Course and a Number of Suggestions by Prominent Motor Boat Men.

THE announcement by Commodore William Randolph Hearst, of the Brooklyn Yacht Club, at the annual dinner of that body on February 24th, that he would donate a trophy and a suitable cash prize for a Reciprocity Motor Boat Race from New York to Halifax has created widespread interest in motor boating circles throughout the country, and that admirable body of yachtsmen that constitute the Royal Nova Scotia Yacht Squadron, a club well known for its hospitality and sportsmanship, has also expressed great interest in the proposed event, assuring the Brooklyn Yacht Club of its co-operation; and before the summer is over we shall become better acquainted with the place whose name has been a household word, ever since the occurrence of a certain historic event, in our Colonial career.

To ocean racing we owe much of the perfection of the present day cruising motor boat and its power plant, and the revival of a national seamanship dormant for many years in our Merchant Marine but kept alive by the yachtsmen of the sailing fleet and the hardy fishermen along our coasts. But besides these indirect advantages the long distance races have practically all been successful as contests, although the courses of some have been criticized on the several grounds: that the objective point is isolated, requiring an equally hard and long run on the return trip; that they have not offered sufficient variety of navigation, or again that the course is so long as to be prohibited to many because of expense or the length of time that the boat is practically out of commission.

It would be difficult to choose a more nearly ideal course for an ocean race than that to Halifax. Practically six hundred miles in length, the distance is not needlessly long, being somewhat less than the run to Bermuda, and once there the contestants may cruise leisurely home, down the Maine coast through waters unexcelled for summer sailing. Although the exact course has not yet been definitely decided upon, it is probable that it will be as laid out in heavy line on the chart on the following pages: along the south shore of Long Island, through Vineyard Sound, past Monomy point, across the stretch of open water to Cape Sable and thence along the coast of Nova Scotia to Halifax Harbor. Such a course taxes the yachtsman's knowledge of all phases of navigation including as it does a stretch of 230 miles of open water where the contestants will be far out of sight of land and will have to depend entirely on the sextant or on dead reckoning, and about 350 miles along the coast and through waters where very careful laying of courses will be necessary.

During the months of July and August the weather in the section through which the course lies is ideal and storms and fogs are no more frequent than in our own latitude. The tides are strong all the way from Monomy Point to Cape Sable averaging between $1\frac{1}{2}$ and 2 knots and even running as high as $2\frac{1}{2}$ knots near the Cape. But the ebb of flow, being almost opposite in direction and nearly equal in strength, practically

neutralize each other so that little or no allowance need be made for them.

It has been suggested by some that the race be run in two stages; for example, from New York to Marblehead and thence to Halifax. Some say that the route should be direct and outside all the way and others believe the course through Long Island and Vineyard Sounds would be best. Still others suggest that the contestants be allowed to choose their own courses, claiming that this would put a premium upon seamanship, and even suggesting that the smaller boats be allowed to stop for gasoline. In explanation of the latter suggestion it is claimed that the chances are about equal whether the smaller craft carry a light supply of gasoline and stop to replenish it or carry a supply sufficient to run the entire course without a stop.

Opinions differ as to the over-all limits for contesting boats, from 30 to 45 feet, having been suggested for the lower limit and as high as 100 for the upper limit. If such a wide range is decided upon there will doubtless be two classes, one for boats from 40 or 45 feet to 60 feet and another for those from 60 or 80 feet to 100 feet. Seaworthiness, of course, is not much of a consideration in determining the lower limit, as boats of 30 feet may be designed and constructed so as to be thoroughly as good in this respect as much larger boats, but the comfort of the crew and the problem of carrying provisions, equipment and fuel, will make it necessary to place the limit probably at 40 or 45 feet.

Commodore J. G. N. Whitaker, of the Yachtsmen's Club of Philadelphia, owner of the veteran ocean racer, *Ilys*, writes us in regard to the race:

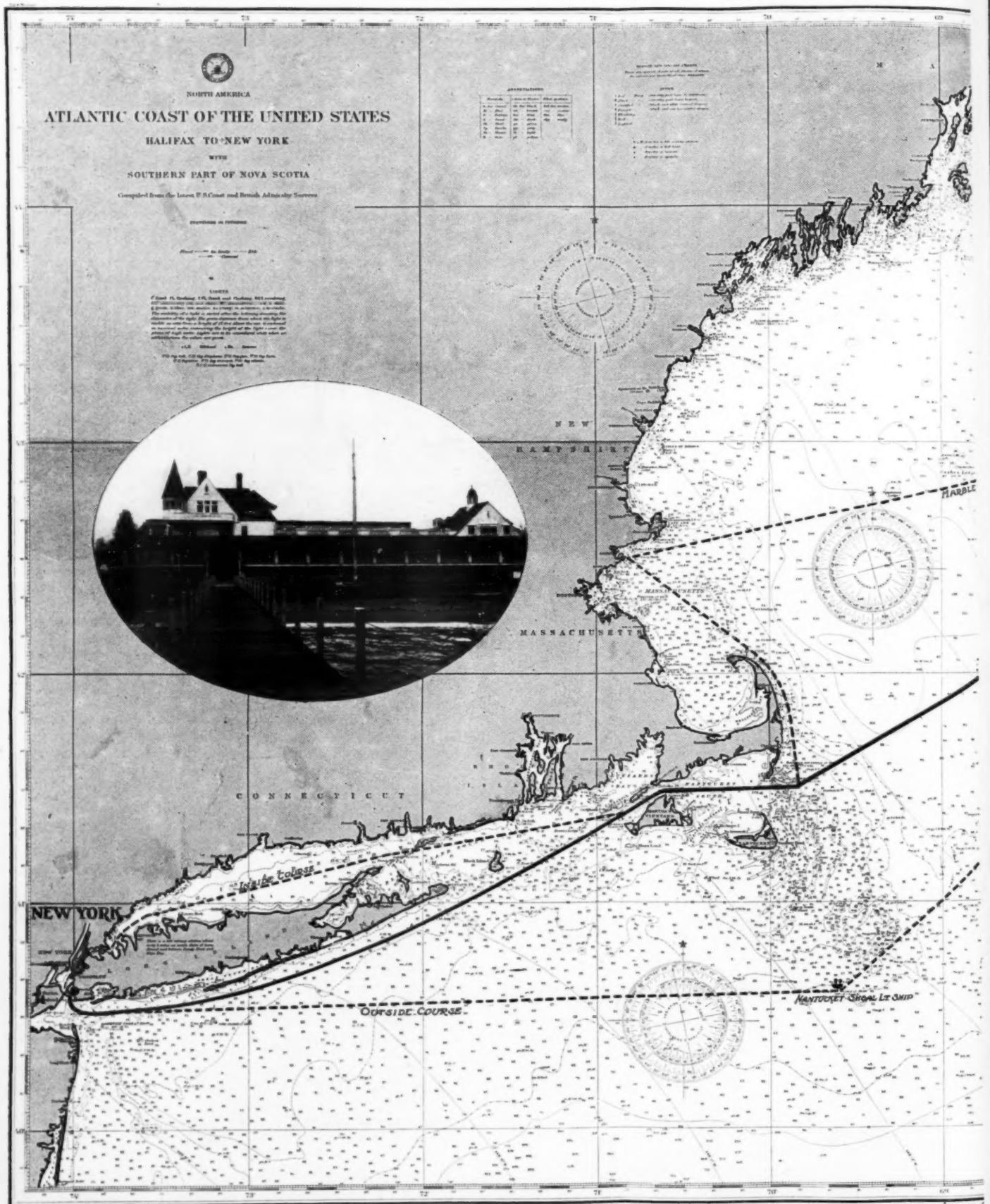
"In the proposed Reciprocity Race for motor boats from New York to Halifax there is offered an opportunity for real deep sea cruising. In my opinion the course for such a race should be entirely outside, rather than through more or less protected waters, like Long Island and Vineyard Sounds. To my mind a course laid out around Nantucket Shoal Lightship and thence direct to Halifax would be a proper one. This would clear all tidal currents and give the contestants good water in which to race. Entrants should be limited to boats of 45 feet and over, as smaller sizes could not carry the necessary amount of gasoline and other stores to make the distance with a good margin of safety. They should be divided into two classes, 45 to 60 feet for one and above 60 feet for the other.

"In the way of equipment the boat should be compelled to carry gasoline sufficient to make $1\frac{1}{2}$ times the distance, carried only in tanks securely fastened to the boat, water and food for at least 15 days, life boats capable of carrying the crew in case of necessity to abandon ship—these could be in the form of dories which nest on deck—distress night signals, sea anchor and such other equipment as was required in the Philadelphia-Havana Race of last year.

"It is also desirable to have some kind of protection around the boat to prevent the crew from going overboard in heavy

Suggested Courses For the New

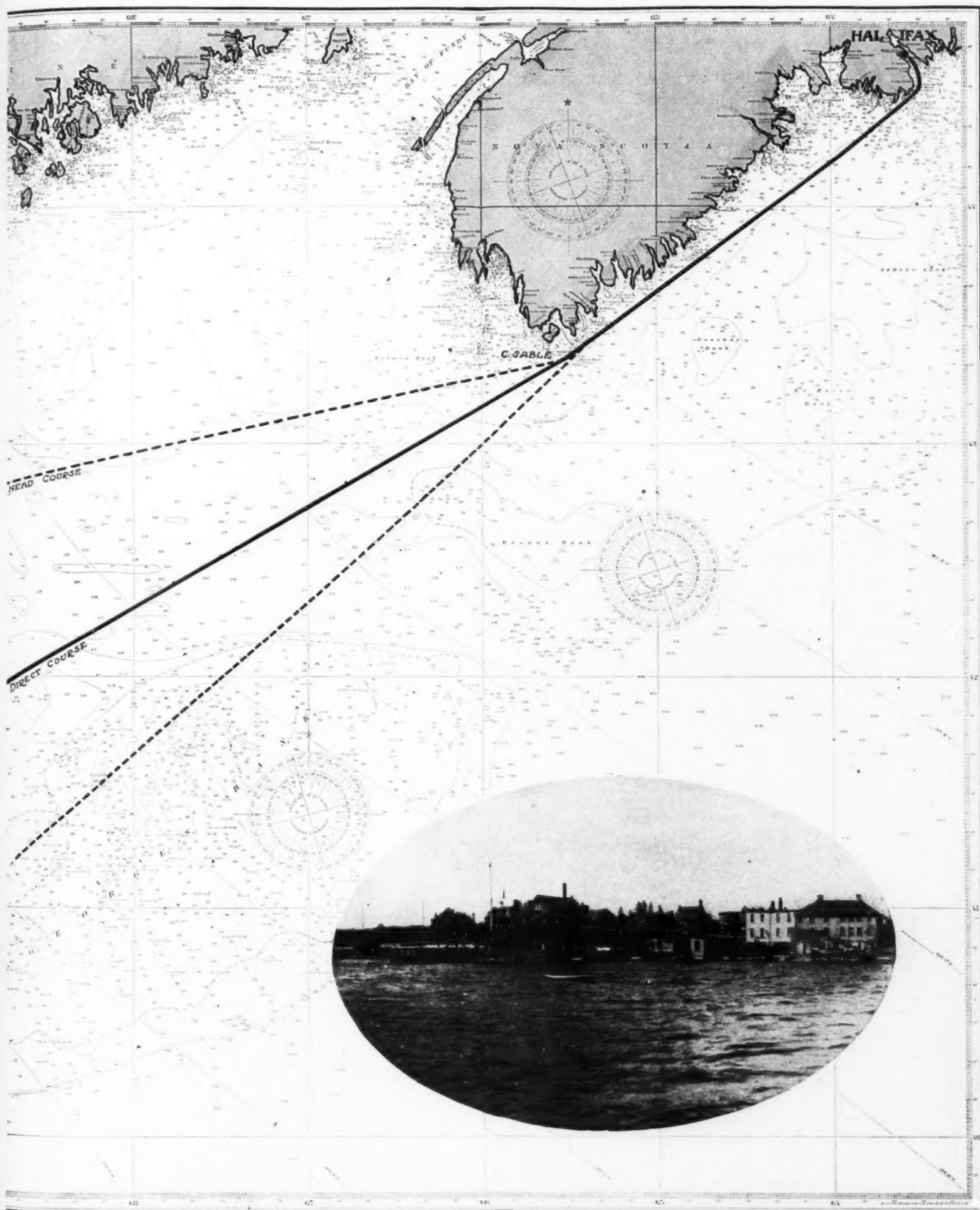
Showing the Outside Route Around Nantucket Lightship, the Direct Route



The Brooklyn Yacht Club from which the race will start

York to Halifax Reciprocity Race.

and the Inside Route Through Long Island Sound With Stop at Marblehead.



Club house of the Royal Nova Scotia Yacht Squadron where the race will finish.

No. 901

weather. Ilys, in the Havana Race had such protection in the form of heavy, wooden stanchions five feet tall lashed around the rail, to which was fastened netting to the height of the stanchions.

"In way of advice to those taking part in this race I would particularly advise care in selecting a crew of handy and willing workers, and I am strongly in favor as far as possible of an amateur crew, because the amateur will take a more vital interest in the work and is spurred on by his ambition, to do his level best. Above all things try out your crew well before the race and in the roughest water you can find. You will thus be able to learn the capabilities of your men. Do not start short handed as the work is hard and trying. Be sure you have a good navigator and check your compass often, as the old proposition, that the straight line is the shortest distance between two points, was never truer than in ocean racing.

"It is unquestionably a fact that since the inauguration of motor boat races the type of cruising motor boat has vastly improved. The designers today are turning out a far superior and more able craft for cruising purposes than could be had a few years ago and the continuation of these races not only gives an incentive for improvement in this type of boat but affords a lot of real men an opportunity to do something to stir their good red blood.

"In conclusion, I want to say that there seems to be an impression among many people that off shore motor boat racing is dangerous. This is not so in a properly equipped and constructed boat, as witness the voyage of Captain Slocum's *Spray* around the world, or Ilys race to Bermuda in 1909 in a two days' gale driving every inch of the way."

Henry R. Sutphen in speaking of the race said: "It is very interesting indeed to learn of another ocean race for motor boats, which events I consider, in the past, have been of material assistance in developing the gasoline marine engine and the seaworthy type of hull. I should think contestants should be permitted to take the inside or the outside route as they may select, but I think with fair weather, better time could be made outside than inside. The race should be run straight through from New York to Halifax without any stops at Boston or intermediate points, it being optional with the contestants whether he stop or not to refill his tanks with gasoline or carry enough fuel at the start for the entire run.

"The lessons that I think have been learned in the past in ocean motor boat races have been that due regard has not been given to the measurement and handicapping of the contesting boats. I think this race should, by all means, be run under the 1911 Bermuda Race conditions, which were given a great deal of thought by a special committee in the Motor Boat Club of which I was a member. In the past, the measurements of the midship sections have been taken at 55% of the over-all length from the bow, which did not always give a true measurement of the boat's displacement to base the handicap upon. The new rules under which the Bermuda race will be run require that the hull be measured in five different sections, which will make it impossible for a freak underbody to gain any advantage, and will encourage the wholesome type of boat rather than one built merely for racing purposes.

"In the matter of measurement, one thing should be insisted upon and that is that all contestants should have their boats ready for measurement one week before the date of the race, so that the measurer will have an opportunity of computing the ratings and handicaps. This I think is a most important matter, as I can imagine nothing more discouraging than to enter an ocean race of 600 miles without knowing the handicap of the various boats. I should think that the race ought to be open to boats of 40 to 100 feet and the requirements of equipment, stores, etc., should be the same as called for in the Bermuda Race."

The well known navigator, Captain B. D. Reese, offers a number of good suggestions. "The contestants," he says, "in this race should be allowed to choose their own route. Should either be a mistake, the result would prove it, and all would be benefited by knowing it.

"The race should be for a continuous run, unless there were two classes, then the smaller boats might be allowed to call on an intermediate port for fuel. No time should be allowed for this, as some boats would make better time by stopping for fuel than by overloading at the start. No boat over 50 feet should be allowed to stop for supplies, as the boat of this size that cannot carry supplies for a 600 mile race is not worth running.

"Of great value are the lessons that have been learned from past races; the type of boat and engines best adapted for ocean cruising over long distances; the necessity for putting

the boat and engine (especially the engine) in perfect condition before the start; the foolishness of overloading in crew, stores or fuel; the absolute necessity of strict discipline, and the exercise of proper care in selecting the crew; also the paramount importance of good steering. No navigator can possibly keep a good reckoning when as soon as his back is turned the helmsman becomes inattentive. One or two careless, inattentive members in the crew can lose any long race when handicaps are so close. During a race the navigator (if not the owner) should be in absolute charge, and the owner should use every effort to support him, if he wishes to win the prize.

"The requirements in the way of equipment specified in the rules of the last year's Havana race were ample for any ocean race. The amount of fuel and oil and all stores should be left to the owner, but no boat should be allowed to start without a reasonable amount of freeboard. I should not have a restriction as to length, as many a boat of 40 feet is better suited for an ocean race than others of 50 feet. Let those under 50 feet have the privilege of putting in for fuel. The rule for freeboard would keep out the ineligible and undesirable.

"The greatest benefits derived from long distance motor boat racing have been the marvellous improvement in boats and men that has taken place in the last four years; the bringing together of yachtsmen of widely separated communities has done wonders to promote friendly interests. There are numbers of yachtsmen to-day who would not hesitate to race across the Atlantic who could not have been coaxed 10 miles to sea four years ago. These benefits may best be furthered by the proposed race by generous prizes, generous terms of admission, a rating committee above suspicion, and liberal, kindly arrangements to care for the contestants at both ends; allowing no one to feel himself the stranger."

The yacht designer, A. Carey Smith, suggests the inside course with a stop at Marblehead. He says: "The course should be through the Sound and then through Vineyard Sound, for the reason that the crews may be broken in and shaken down each in his place, also to develop any troubles with motors where there is a chance to make a harbor. All contestants should follow the same course. It would be better to make the race to Marblehead to allow the crews some rest and to look the engines over, before taking the run to Halifax. No boat less than 45 feet on deck should be allowed in such a race."

Secretary Clarke of the Royal Nova Scotia Yacht Squadron writes: "In regard to the best time of year for the Reciprocity Race, August is the best month as there should be no fogs and very light winds at this time. As regards navigation, it is a comparatively simply matter, the only troublesome part being around Cape Sable, there being on this particular part of the coast variable and strong currents, but even taking this into consideration it is considered perfectly safe as the chart is very clear and every danger point is well buoyed.

"The Squadron would be very glad to have the contestants and all parties connected with the race make their headquarters at our club during their stay in the city."

Henry Douglas Bacon, the builder and owner of *Yo Ho*, the Bermuda racer, writes: "It is my opinion that this race should be run in one stage, that is, without intermediate stops. Of course, the boats should be allowed to run into ports should they so desire but the race should be continuous from New York to Halifax. In regard to the course, if the class is going to be unlimited and boats from 36 to 60 feet allowed to compete, I should say that the course should be an inside one. The course originally run by the New York-New Rochelle racers would be a good one from New York to Cape Cod and from there on certain points such as the Portland lightship, Sequin and so on up the coast to Grand Menan Island and then across to Grin Island and thence up the coast, otherwise the large boats could lay a straight course which would carry them way outside, thus cutting off a great distance.

"This course would be unsuited under certain conditions for the smaller boats taking them far off shore in a locality where there is a liability of continued fog and nasty seas. More advantage would be gained by allowing the small boats below 45 feet to compete in this race than there is by letting the larger ones only, and with a course such as indicated there is little real danger as good harbors are not far apart along the coast and the only real bad place would be the run across the mouth of the Bay of Fundy. The conditions governing the race should pretty closely follow the New York Bermuda race.

"Crew:—The crew should consist of sufficient number to allow for three shifts and the one in charge should be an amateur.

(Continued on page 56.)

Brunhilde's Power Plant.

Two Twelve Cylinder Engines That Originally Turned Ursula's "Brace of Bucking Screws."
760 Horse Power That is Expected to Drive the New Hydroplane to Victory.

THE famous power plant shown below is a striking proof that the modern gasoline engine and even the light racing engine, to which class it belongs, can be built to withstand several seasons of the hardest service. These two twelve cylinder Wolseley engines made their debut two years ago in Ursula, the famous 15 meter racer that won in the unlimited class last year at Monoco, at the remarkable speed of 43.6 miles per hour. Last season one of the motors was installed in Pioneer, the 40-foot Fauber hydroplane which, but for an accident, would surely have beaten Dixie in the race for the British International Trophy, and this year they are in Brunhilde, the new 50-foot racer just launched at the Saunders yard for the Duke of Westminster.

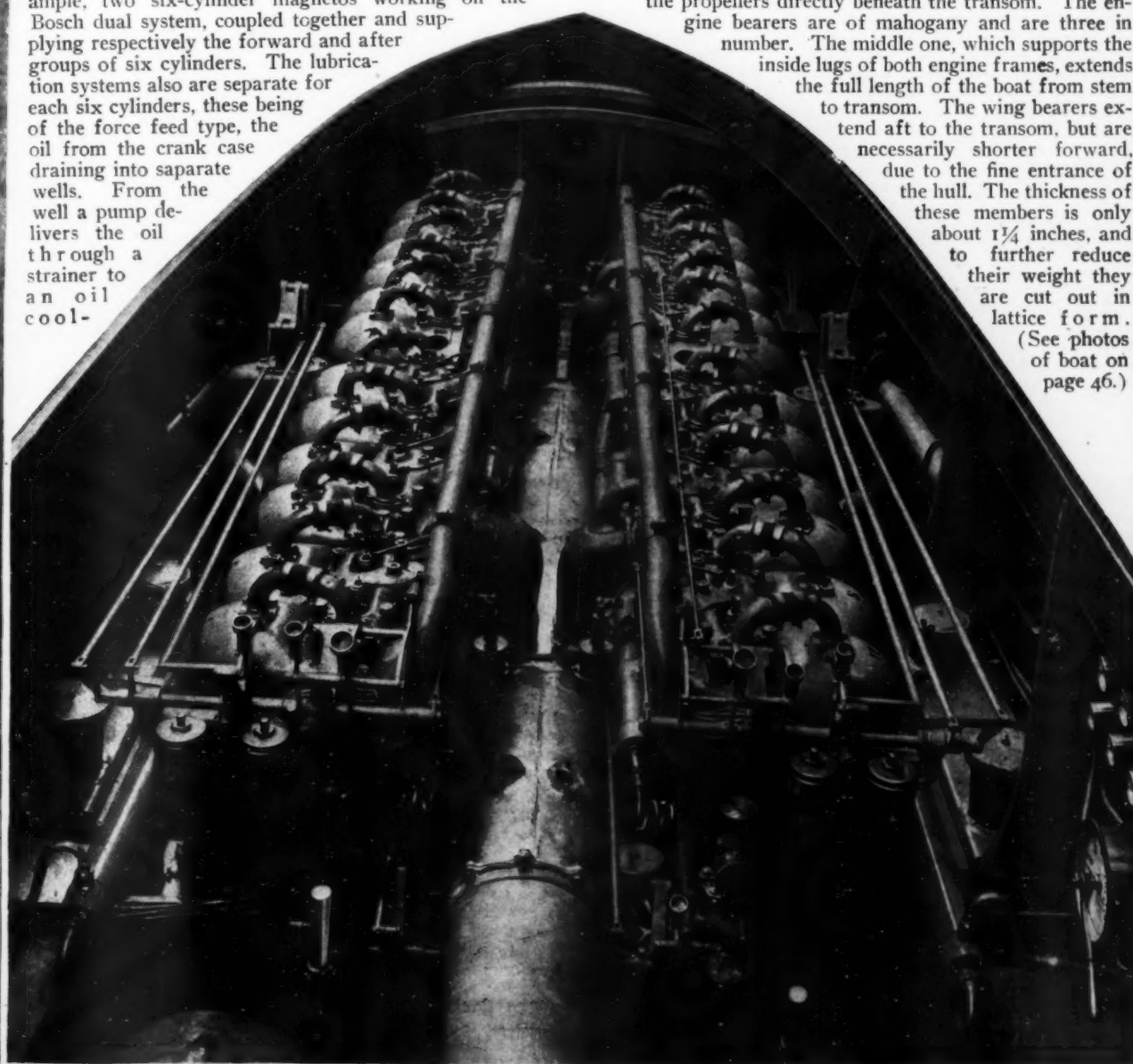
The two twelve cylinder Wolseley engines develop 760 h. p. in the aggregate and it is almost safe to predict that they will drive Brunhilde to victory and to a new record at Monaco. The cylinders are constructed with copper water jackets, all the valves being on one side and fitted with water cooled valve caps. A single carbureter supplies each set of 12 cylinders but, in other ways, each engine may be regarded as two units. There are, for example, two six-cylinder magnetos working on the Bosch dual system, coupled together and supplying respectively the forward and after groups of six cylinders. The lubrication systems also are separate for each six cylinders, these being of the force feed type, the oil from the crank case draining into separate wells. From the well a pump delivers the oil through a strainer to an oil cool-

er, a separate pump drawing it from the cooler and delivering it to the various bearings. The weight of each engine is practically 3,000 pounds.

The photograph shown below was taken when the motors were installed in Ursula, but practically the only alteration in the installation is the shifting of the water pumps from the forward to the after end, where they are more easily kept below the water line. They are driven from the forward end by shafts fitted with universal joints. On the port engine there is a friction clutch arranged to take up the first part of the drive, after which a positive clutch engages and takes up the full power. The starboard engine is fitted with a jaw clutch only. The propeller shafts pass through steel stern tubes, this metal having been chosen to prevent electrolytic action. There are short intermediate brackets just behind the first step from the stern where the flanges of the brackets are kept well out of the way of the passing water. The stern brackets are V-shaped and are made with a view of offering the least possible resistance. The flanges of these brackets are countersunk into the planking of the boat, and their positions are just far enough forward to bring the propellers directly beneath the transom. The engine bearers are of mahogany and are three in

number. The middle one, which supports the inside lugs of both engine frames, extends the full length of the boat from stem to transom. The wing bearers extend aft to the transom, but are necessarily shorter forward, due to the fine entrance of the hull. The thickness of these members is only about $1\frac{1}{4}$ inches, and to further reduce their weight they are cut out in lattice form.

(See photos of boat on page 46.)



FITTING OUT

SPRING is housecleaning time for the boatman and as the owner looks forward with glad anticipation to the coming days afloat, he generally begins the annual overhaul of the motor boat with better grace, and more thoroughness than when laying up the craft for the winter. This is but natural and while one is not apt to feel very enthusiastic at the tail end of the season, yet 'tis poor policy to leave the boat to winter in practically the same condition in which it finished the late autumn cruise. This advice applies to the outside of the "ship" as well as in, and doubly so to the power plant, which if neglected during the boat's period of inactivity, is pretty sure to be found badly rusted, and in anything but its original condition. However, it is not my intention to write about overhauling the entire craft, but to specialize, so to speak, and give the readers of *MoToR Boating* a few timely hints and suggestions which many years of boating have taught me to observe. We will begin therefore with the motor and end with the motor, for a gas engine demands a thorough overhauling to put it in good shape for the season's service. As four- and two-cycle motors are alike in common use, it will be well to touch upon the important points of both types, and that all skippers may find, perhaps, some little "meat" in the following, it has been deemed advisable to take up each type of motor separately.

IN overhauling the motor, whether it be of two- or four-cycle design, it is essential to "knock down" the engine completely, for it is only by taking the power plant apart, that the owner can ascertain the present condition of the cylinders, piston and crankshaft, replace any badly worn part, and make any needed adjustments. To begin right, the engine first should be stripped of magneto, carburetor, water and fuel pipes and their connections, lubricator and lubricating leads, and the valves and valve operating gear. That all the many small parts may be kept out of the way and yet be found readily when assembling the motor, the amateur will do well to find two or three cigar boxes in which to place the units as they are removed. By so doing, the little things are prevented from being misplaced, and the boatman will not be obliged to hunt high and low for a missing screw or bolt.

Having stripped the motor, the next logical step is to unscrew the holding down bolts which fasten the cylinders to the upper half of the crankcase, and lift off the casting. If the boatman is doing the overhauling by "his lonesome," he will find it far easier to lift the cylinders off their pistons, than to uncouple the rods at the crankshaft and endeavor to remove the whole mass together. As even a comparatively slight side strain will spring the crankshaft and connecting rods out of proper alignment, the man on the job should make it a point to lift off the casting with the pistons in a vertical position. This may be accomplished by one man if some little care is taken, but if you can find someone to lend a helping hand and hold the pistons upright while you are pulling off the cylinders, it will expedite matters somewhat.

The removal of the cylinders will expose the crankshaft, and the pistons with their

By Stillman Taylor.

connecting rods may now be readily uncoupled from the cranks by withdrawing the bolts at the lower or "big ends." That the overhaul may be thoroughly well done—and nothing short of a workmanlike job should be attempted—it is more convenient to proceed systematically and clean and assemble each separate unit as soon as it is taken apart. Screws, bolts and other small components should not be overlooked, and a small bristle vegetable brush will come in handy for removing grit and old oil from threads, and other small surfaces. The inside cylinder walls will probably be found in fairly good shape, providing the motor has been given ordinarily good care, and any small accumulation of carbon may be removed by swabbing out with kerosene or gasoline. In case considerable carbon is found, the hard flint-like scale first should be well soaked in kerosene to soften up the crust, and then removed by scraping with a keen edged tool. As a four-cycle motor requires a much higher compression in order to produce maximum power efficiency, than is necessary in motors of the two-cycle design, it is highly important to keep the cylinders and pistons free from carbonized oil, and to have the piston rings a good snug fit within the bore. The rings should be examined and if "blow marks"—black sooty marks running across the polished faces of the rings—are discovered, the gas is leaking past them and the defective rings should be renewed. It is always advisable to order rings and other parts direct from the makers, as the amateur will not then be called upon to file them up to shape. The work of fitting a new piston ring is much more difficult than many suppose, as the joints must have sufficient clearance when cold to allow for, and so prevent binding when the metal rings expand under the heat of the explosion, and yet not left too loose or the compression of the motor will be greatly impaired. After cleaning up the pistons, the wrist or gudgeon pins should be adjusted to a good tight fit in their bosses by setting up on the set or anchoring screw. If ridges are discovered on either side of the pin, fitting the little end of the connecting rod, the pin is badly worn and should be renewed. In this as well as many other parts of the motor, any badly worn part should be renewed promptly at the time of overhauling, and so prevent the many little annoying breakdowns which are almost certain to occur if the proper maintenance of the power plant is not carefully attended to.

AS most of the wear and tear which an engine is subjected to, will generally be found within the crankcase, the crankshaft should come in for proper attention. The main crank as well as the wrist pin bearings should fit quite snugly, and in a new or well adjusted motor, no appreciable looseness or play should be evident. Looseness through wear, is of course, the principal factor, and this may be discovered quickly by moving the shaft up and down and sideways. If much play is present, the amateur should apply the obvious remedy, and as this particular phase of overhauling is an all important adjustment, the work should be done carefully. The boatman will note, that in four-cycle motors, the

bearings are of the split bushed type, and looseness is taken up by inserting thin pieces of metal (called "shims") between each bearing and its seat. In the case of slight ordinary wear, it may only be necessary to remove one or two of these shims to effect good adjustment. However, if the bushing is very much worn, it will be found more satisfactory to renew the bushing than to attempt lining up the old worn out bushing by shimming. If the bearing surfaces are not smooth as they should be, but rough and unevenly scored, the metal must be smoothed up with the scraper. To scrape in a bearing, the amateur requires at least two steel bearing scrapers, and it is best to procure these from the motor boat accessory store before beginning work. A little red lead or common blueing applied to the bearing surfaces will indicate the parts to be scraped. Though some little experience is necessary before one can scrape in a bearing properly, the amateur will encounter no difficulty if he will but proceed slowly and carefully and let the second cut of the tool overlap and so smooth out the ridge made by the first cut. But very little metal should be scraped away at a time and the bearing should be repeatedly tried for a good fit. In adjusting the crankshaft, it should be remembered that the fit of all bearings is based upon the speed of the shaft and also upon the work they are subjected to. In general shop practice the assemblers invariably leave about .002 play for every inch of crank diameter; that is, if your crankshaft is of some 2 inch diameter it should be assembled with about .004 play, certainly not less than this amount. As it is well known too much play will cause hammering and will produce a "knocking" sound within the cylinder, similar to that produced by an excessively advanced spark.

THE crank pin bearings should be adjusted in the same manner as the main crankshaft bearings. The work of scraping these bearings must be done very carefully, as it takes but a comparatively slight error to throw the connecting rods out of alignment. To avoid doing this, the boatman will save much trouble by inserting new bushings in the first place, as the cost of new bushings is very much less expensive than the hire of skilled labor to put the old bearings in running condition. When the bearings have been properly fitted, they should be snugly bolted up, and tested by turning the shaft in order to determine if it moves freely. The bearings should then be well lubricated with oil and when the motor is first run, more oil than usual should be supplied for the first few days.

The valves should now come in for attention, and if not perfectly gas tight, they must be ground in. A fine grade of emery or carborundum will be found most suitable for general use, but in case the valves are in bad condition, and deeply scored and pitted a coarser grade of emery may be used first for grinding out the deep marks; a fine grade being used for the final polishing. In using emery, it is a good plan to put a little of the grinding medium in a tin can cover, add enough kerosene to form a rather thinnish paste, then add a few drops of heavy oil to give the grinding mixture more body and prevent running. A little emery worked up

in vaseline will serve the purpose equally as well. To prevent the possibility of the particles of the abrasive from working into the cylinder, where it would cut and ruin the polished inside walls, it is well to insert a wad of waste in the port leading to the cylinder. Grinding may be easily and quickly accomplished by smearing a little of the grinding paste on both seat and face of valve and rotating it in its seat by inserting the blade of a screwdriver in the slot. A geared drill or a bit brace and screwdriver bit are also convenient. That uniform grinding may be done, the valve should be rotated a dozen or so times in one direction, then lifted up from its seat, turned partly around, and rotated as before. More emery will of course be needed as the grinding proceeds, but the amateur should remember that a very little grinding medium will not only grind much more rapidly but will also do a much smoother job. At any rate, the grinding should continue until both valve and its seat are smooth and bright and quite free from score marks and scratches. When all the valves have been ground in, the valves and seats should be cleaned carefully with gasoline, and the waste removed from the cylinder ports.

After the motor has been assembled, the boatman will very likely discover that much valve grinding has lengthened the valve stems and that there is insufficient clearance between the stem and the tappets. As a general thing, the required amount is more or less correctly approximated by an allowance of $1/32$ inch play, although the exact amount will be found to vary somewhat in differently designed motors, depending upon the profile of the actuating cam. However, $1/32$ inch may be safely taken as a guide, and an ordinary business card or tag may be inserted between the valve stem and the tappet to approximate this adjustment near enough for all practical purposes.

* * *

THE precise order of valve timing also varies considerably among different makers, but for multiple cylinder motors, the writer has found that the majority of marine motors are correctly timed when the exhaust opens from 30 to 40 degrees before the crank reaches the lower dead-center position. Many makers so time their engines, that the exhaust closes at about head dead-center, but the average motor will give better results by timing the exhaust to close from 5 to 10 degrees after passing head dead-center. The inlet valve should, of course, open immediately after the exhaust valve closes on its seat, and for a guide the boatman may take the average timing which is about 5 degrees after passing the head dead-center position. The inlet valve closes from 25 to 40 degrees after crank passes lower dead-center position.

Owing to the fact that a heavy accumulation of carbon will result in preignition, the cylinder and piston should be thoroughly cleaned and kept so by proper adjustment of the mixture and attention to the lubrication. If a good soaking in kerosene is not enough to remove the old oil, the cylinder head may be unbolted and the combustion chamber scraped out clean. In assembling bearing surfaces and other moving parts, they should be well oiled or greased as the work proceeds. In short, the entire motor should be put into as good running order as when new, and no detail of the work should be in any wise overlooked, or neglected.

THE work of overhauling a two-cycle engine is much the same as that entailed in overhaul-

ing the four-cycle design, and to avoid unnecessary repetition, the writer will confine these hints to those features which may be taken as characteristic of this popular type. As these differences involve the operating principles of the two-cycle motor, they should be given careful consideration at the time of overhauling. Every boatman should know that a perfect working two-cycle motor must have a certain amount of crankcase compression in order to perform its functions and to produce full power. This base compression is normally of some 5 to 6 lbs. pressure to the square inch, and is accomplished by the down stroke of the piston, thus very materially assisting the quick transfer of the incoming gas to the cylinder by way of the inlet by-pass or transfer port. To prevent the slightly compressed gas from escaping through the exhaust port by blowing past the piston, practically all motors are provided with a gas-tight ring at the base of the piston. This packing ring is one of the points to be examined, since if in a leaking condition, the escape of compressed gas from the base will lower the power of the motor and prove wasteful of gasoline as well. And again, the piston itself must be a good snug fit within the bore, although this detail is not so essential when the motor is equipped with a mechanically actuated valve between crankcase and the by-pass passage. There are, naturally enough, other points where leakage may occur. A poorly fitting piston, or gudgeon pin, for instance, may possibly be productive of some small leakage, although the oil and carbon tends to seal up any small openings resulting from an imperfectly fitting piston pin. Perhaps the most likely point for leakage in addition to the above mentioned causes, is due to the packing between the bottom and lower sections of the crankcase. A little oil run around the suspected packing will determine the tightness of the joint, the formation of bubbles indicating leakage.

To prevent undue wear of the shaft, the main or crankshaft should be kept snugly adjusted. This applies to engines of all types, but especially to the two-cycle motor, where base compression is a very important factor in producing power. A loose shaky bearing makes a "harsh" running engine and likewise affords an opening for the entrance of air to the base, resulting in marked loss of power. It may, therefore, be taken as good advice to look over the bearings thoroughly and if the shaft is found worn out of true and oval, the amateur should not attempt to work it up, but turn it over to a capable machinist for repair. This applies to the crank pin bearings also, and in case the bushings are found to be considerably worn, much time and labor is saved by inserting new ones.

* * *

THE electrical plant and ignition layout requires some little attention, and where jump spark ignition is used, the high tension system should be well overhauled and any needed repairs and adjustments attended to. The wiring must be well insulated and if any worn or thin spots are discovered, they should be well taped or a new length of cable connected up. The timer should be cleaned of old grease, washed out with gasoline and relubricated with oil or packed in grease, depending upon the type of circuit maker used. The magneto need not be taken apart as it will probably only require a little surface cleaning and lubrication with a few drops of some light bodied oil. Where a storage battery or accumulator is used, it should be examined and if a brown deposit is found to have collected in any quantity at the bottom, the electrolyte should be poured off into a glass bottle and the cases washed out with clean soft rain water. The top of the battery should be cleaned of acid. Clean the terminals of any corrosion and

make it a point to ascertain whether the air vents are not clogged. In case the battery has been neglected, either because the electrolyte has been allowed to get below the proper level, or because the cell has not been charged at frequent regular intervals, it may get a bad case of "sulphating." This chemical action between the lead grids and the paste filler, may be recognized by the presence of a white flour like film on the face of the plates, or it may take the form of white spots. When this is found, it is clearly a case of neglect, and to restore the plates to their normal condition, the electrolyte should be poured off and the case washed out with rain water. For a very bad case of sulphating, the plates may be washed off with a wet cloth, and if this fails to remove the film-like coating, the plates must be scraped. Pour in only about seven-eighths of the electrolyte and fill up to cover the tops of the plates with filtered rain or distilled water. It may be mentioned, that the specific gravity of the electrolyte should not be less than 1.150 and while a certain latitude will do no harm, a hydrometer reading of 1.250 is recommended. This is about the same as one part sulphuric acid to $4\frac{1}{2}$ parts water, and in case the hydrometer is not at hand will be found sufficiently accurate. In case the electrolyte is lower than 1.150, pure sulphuric acid (C. P., not commercial) should be added a little at a time until the hydrometer gives a 1.250 reading. If too much acid is added through mistake, pour out a little of the electrolyte and reduce with distilled or filtered rain water. If the plates of the battery are found bent or "buckled," or in the event that some of the paste has dropped out of the pockets, the battery should be sent to the makers for an overhauling.

* * *

THE sparking coil also should be looked over and it is probable that the vibrator points will need trimming up and adjusting. This is most conveniently done by filing up with a thin jeweler's or manicurist's file. In doing this work remove as little metal as possible, and file the surface flat and true that a good broad contact may be had. In adjusting the tension of the vibrators, it is important to get a comparatively light tension and the vibrator should have a flexible and moderately high pitched buzzing sound. As proper and maximum coil service can only be obtained when all the vibrators are tuned as closely alike as possible, the particular amateur who likes to have things done right, should procure a special sensitive ammeter and measure the current consumption of his coil. While some slight variations are noted in the different makers directions, the adjustment is between 5-10 and 6-10 amperes.

In tuning up the motor on its first trial trip for the season, the matter of carburetor adjustment should be given some careful experimenting. The entire range of mixture variation should be familiar to every boatman and a little systematic work in this direction will often give quite a little extra power as well as cut down the gasoline bill to a lower figure. In adjusting the carburetor there are one or two little points to be considered. In the first place, the boatman naturally desires to get all the power the engine is capable of transmitting, and to do this, and at the same time keep the fuel bill well within reason, it is important to adjust the carburetor to give as lean a mixture as possible without sacrificing motor power. This point of carburetor balance can only be found by varying the mixture volume while the motor is running. To do this, the engine should be started, and



after it runs smoothly, retard the ignition and open the throttle about half way. The gasoline adjustment is now made by screwing down on the needle valve until the motor commences to miss fire, and then gradually open it until the motor runs at its highest speed. You now have the maximum fuel adjustment, and the lock nut

should be tightened up. The next adjustment is to regulate the air supply, and this is done by advancing the spark until the motor runs at its maximum speed without misfiring. Now close the throttle and retard the spark until the motor turns up slowly. If the motor runs too fast or stops at this point, the mixture is probably too rich, and more

air should be admitted, or the gasoline feed slightly reduced, until the engine responds to the throttle opening. When you have arrived at this point of flexibility you have struck the point of balance and will obtain the full rated horse power from your motor with the minimum consumption of gasoline.

The Spring Painting

By Captain Joe.

BOATMEN, so far as the maintenance of their craft is concerned, may be divided into two classes; those who possess large and pretentious cruisers, and those who are proud owners of thirty footers or other small craft. The first class naturally employ others to do the work for them, but the latter, who comprise the greater number of the fleet, find much pleasure in doing with their own hands the numerous odd jobs necessary to put their little "ship" in condition for the summer months. It is with the hope of lending a helping hand by smoothing out some of the difficulties which often perplex the amateur when he attempts to paint and restore his motor boat, that the writer has ventured to put in print a few hints and suggestions gleaned from many years boating experience. For there is a right way for doing all things, and while the inexperienced is likely to think 'tis dead easy to dress ship with a brush and a pot of lead, the quality of work turned out by the novice may generally be taken as pretty good evidence that even painting, varnishing and smoothing up a boat demands no small amount of skill. We will consider the important points in their logical order.

The amount of work required to put a boat in first class shape depends upon how well the craft was built in the first place, and also upon the care it has received since it left the builder's hands. If the product of any reputable shop, there will be no fault to find, since planks are well fitted and caulked, but if badly wintered and used by the owner, there will doubtless be much work to do. In any case, the outside surface of the hull must be smoothed up before the paint can be properly applied, and any rough spots, due to swelling wood, flaking paint, or the hard knocks of service, must be eliminated. If the old pigment is very rough and flaky in spots, these may be scraped down, sandpapered smooth, and the bare wood given a primer of white lead and oil. There is, however, but one way to make a nice smooth hull and to put your boat in anything like its original smoothness: all the old layers of hardened paint must be scraped off.

The old way of cleaning up the boat's topsides by the use of sharp steel scrapers, can only be accomplished by the exercise of considerable elbow grease, and owing to the large amount of time and labor involved, the boatman will do well to avoid this very laborious method. The shipyard hands generally burn off the old paint with a small gasoline torch, and this is a very satisfactory method, though some little care must be taken until the amateur gets the knack of handling the hot blue flame. Another, and even better way of doing this work both quickly and well, is to use one of the several chemical paint and varnish removers. In this case, no special skill is necessary, as the liquid is simply applied over a portion of the surface with an old brush, and after a minute or so soaking, the softened pigment is readily removed with a scraper or pushed off with a broad blade putty knife.

When all the old paint has been removed down to the wood, the boatman will no doubt discover many rough spots, caused by nails working out, planks becoming slightly loosened through constant vibration of the motor, and, as it often happens in boats which have seen some little service, the caulking may have started in the seams. Right here, the writer would caution the boatman not to rush his boat to the water, but take ample time to put his craft in proper trim. It takes some little time, to be sure, but if you would have a nice smooth exterior make up your mind to give this preliminary work proper attention. Accordingly, if the edges of the planks have worked out to form ridges, these should be smoothed up with a small sharp plane, taking care to avoid dulling the iron against projecting nail and rivet heads, which should be filed off flush with the planking. This done, the work should be sandpapered down smooth.

* * *

IF the boat is an old one and the caulking has partly rolled out between the planking, the leaking seams must of course be recaulked. If the boatman desires to do this work himself, he should first have some intelligent idea how it is done, for to caulk a boat properly does not merely consist in pounding cotton in an open seam. But before recaulking is attempted, it is first necessary to remove all the old cotton from the seam. This may be done with a knife if the seam is small. In the case of larger boats the seam is cleaned out with the beveled edge of a "reefing iron."

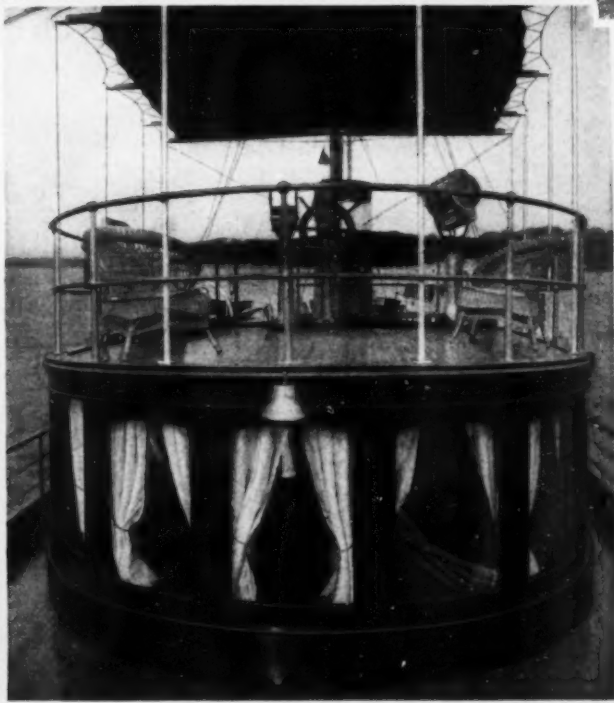
For small and lightly planked boats, common candle wicking is generally used, and this is best forced into the seam with a caulking wheel. For larger and more stoutly constructed craft, regular caulking cotton is most suitable and this is driven into the seam with the regulation caulking iron and mallet. When endeavoring to tighten up the seams of his boat, the boatman should seek to avoid the amateurish mistake of driving a big wad of cotton with great force into the seam. This is hardly necessary, for if considerable force is used on the old soft wood the caulking will be very likely driven through and so break the seam. If this happens the seam can only be made water tight by fitting a batten of butt block over the opening on the inside, which must be well nailed and clinched. It may be mentioned, that the seam should not be entirely filled with cotton, but sufficient space should be left to hold the putty, which finishes the seam flush with the outside surface. Ordinary caulking is putty will hold well if the first brushed over with white lead.



THE hull is now ready for the paint, and here again the amateur is very likely to make a botch of it if some few important details are not closely followed. For making a smooth white outside surface, the writer would advise the use of an almost pure turpentine paint. Outside enamels are used, of course, and while these hard drying pigments produce a very glossy surface, their hardness is a decided disadvantage, in that a hard drying paint is very prone to peel and flake off under general wear, and thus become rough and make scraping necessary every year or two. Where expense is not an important consideration, this class of paint will no doubt prove popular. A turpentine paint, on the other hand, is of good color, it is flexible, and owing to the fact that it rubs off a little during service, the surface is always smooth, even after several seasons of painting. Any good prepared paint will also be found fairly satisfactory, and for the average boatman, one of the several widely advertised brands of yacht white or black may be safely chosen. Cheap ready mixed paints put up for house and general painting should be avoided, however, as they are likely to turn black or "mildew," as well as peel and crack. If the amateur prefers to mix his own pigments he should buy the best keg lead he can find.

The matter of brushes is yet another point to be considered, since it is well nigh impossible to properly brush the paint out with stubby or illy put together tools. For general outside work a four inch wall brush will prove most convenient, and a two inch size will come in handy for touching up small work. A couple of sash brushes will also be required for "cutting in" corners and other places where the larger brushes cannot be used. There are brushes and brushes, and as a really good brush may be used for several seasons if properly put away after using, the boatman should begin right by selecting brushes of good grade. In picking out a brush ascertain if it is thickly set and of long hair, well bound with brass. Don't buy your brushes at the ten cent store or accept at any price a tool in which the bristles are thinly set. As a guide to selection, it is well to bear in mind that the best brushes are invariably made of long gray and white mixed Russia bristles, while the cheap grades are made of black China bristles, thinly set in nickel ferrules. Brushes of the latter class are forever shedding loose bristles and are too thin to hold much paint. Before using, part the bristles, stand the brush upright on its handle and pour a little water onto the wooden head. This will swell the dry wood and "tighten up" the hairs, thus reducing shedding to the minimum. Before beginning work, dip the brush in the paint and draw it across a rough board two or three times to work out any loose bristles that have not been gripped by the ferrule. When through using, and while waiting for the first coat to dry, keep the bristles immersed in paint or oil, and when the painting job is finished.

(Continued on page 76.)



The after and forward decks of two modern power yachts. Note the bridge on deck house roof.

Decks and Deck Arrangements.

The Unlimited Field Above the Water Line for the Ingenuity of the Designer.
The Problems of Arrangement Encountered on Boats of Various Sizes.

By Wm. W. Nutting.

WHAT might be called, at an afternoon tea, the aesthetic side of yacht architecture, plays nearly as great a part in determining the shape and especially the arrangement of the above water parts of the boat as do the considerations of stream line flow, skin friction, wave making resistance, etc., in the design of the underbody. Utility is, of course, the first consideration, and rightly so—for beauty won't keep a grayback from washing you overboard in a seaway. In fact utility should be the source of our ideas of beauty. The trim Gloucester fisherman and the full rigger, would satisfy the aesthetic sense of the most particular "rocking chair fleet," and still they have been evolved by a bunch of hard-headed seamen with a weather eye on speed, seaworthiness and all round practicability. The law of the survival of the fittest applies here just as truly as it does in the animal world, and beauty that can do only nine knots where utility can do ten, is bound eventually to become ugly in the eyes of the sailor.

Precedent, or perhaps we had better call it inertia, plays a strong part also, and in this transitional stage of development, perhaps too strong a part, in our designs. We are continually being shocked at any departure from the conventional and some of the foreign craft, for instance, seem to us more the products of a disordered imagination than of rational designing. But at least they show dissatisfaction with existing standards, without which there can be no progress.

And then there are other considerations such as placing the weights so as to preserve trim and seaworthiness, but apart from all these there is a large field in the design of yachts, unrestrained by rule or formula wherein the ingenuity and taste of the architect have full reign. And for some of us the problems in this field are fully as interesting as the purely technical ones. Laying out the interior so

as to obtain the greatest amount of comfort and convenience, is a big subject in itself, and our present concern is more with the arrangement of the exterior—the deck, its houses, etc.

Probably the biggest problem of the medium sized cruiser is to obtain enough deck room without sacrificing the interior accommodations. In the smaller craft, a cockpit is depended on entirely for outside accommodation and little else can be done in this direction, except, in boats of the trunk cabin type, where the trunk offers possibilities for the ambitious guest who is content to sit anywhere but on the orthodox seats.

But the bigger boat—the 40 to 60 footer—has problems peculiar to itself. In boats of this size, the flush deck usually takes the place of the cockpit, but it now becomes desirable to handle the boat from a point farther forward and also to have deck space forward with an unobstructed view. We may assume that the raised sides and deck forward are common to all craft of this size, and with this to start on, a number of variations are possible. The first, and until recently the most common arrangement, was to extend the raised deck aft to form the roof of a cabin trunk, giving runways at the sides, providing better light and ventilation for the living quarters and making available the roof of the trunk as a sort of bridge deck. This steering deck, while far enough forward, was rather high and poorly protected, as there was nothing in front of it. No considerable deck house could be placed in the middle of the raised deck of such a craft without looking "stuck-on," although the use of spray cloths, laced to a low rail, or a low house as shown on page 15, might offer sufficient protection, to ease that perched feeling one has on a high deck with nothing in front of his shins.

The popularity of the bridge deck on craft

in the neighborhood of forty-five feet, and admirably illustrated by the bridge deck cruisers of this length at the New York Show, is a very good criterion of their practicability. The raised deck forward extends to the bridge deck, which is continuous with the main flush deck. The raised sides are continued aft a few feet farther in the form of bulwarks forming protection at the sides, and with the forward end of the cabin trunk as a seat, this "little deck" is as snug as a cockpit and is an admirable place from which to handle the boat. The space of limited headroom under the deck offers a logical place to install the motor, and the forecabin is, of course, beneath the raised deck forward. The runways at the sides of the trunk drain the bridge and connect it with the flush deck or cockpit aft, and for all round convenience and practicability the layout is one that it will be hard to improve upon.

The principal objection to the deck house on boats under sixty feet is the top hamper, for even if sunk somewhat, it gives a top-heavy appearance. But on a sixty-footer, such a house is thoroughly practical, although on a boat of this size it may not be possible to install the motor or motors beneath its floor. However, we are not concerned with the "below decks," and by sinking the floor below the level of the main deck and perhaps crowning the forward deck, the apparent height is not enough to be objectionable. The space just abaft it is, of course, the logical place for the bridge, while a duplicate steering and control equipment may be installed in the house for use in bad weather.

On still larger boats, say the 98 footers, the top of the deck house is sometimes used as a bridge, and if the after position is retained for the bridge, a raised platform is necessary because of the increased height of the house, whose floor, on boats of this size, may be flush

(Continued on page 74.)



Above, flush deck showing arrangement of skylights and small trunks; below, interesting arrangement of trunks, raised sides and spray cloths protecting steersman's position.

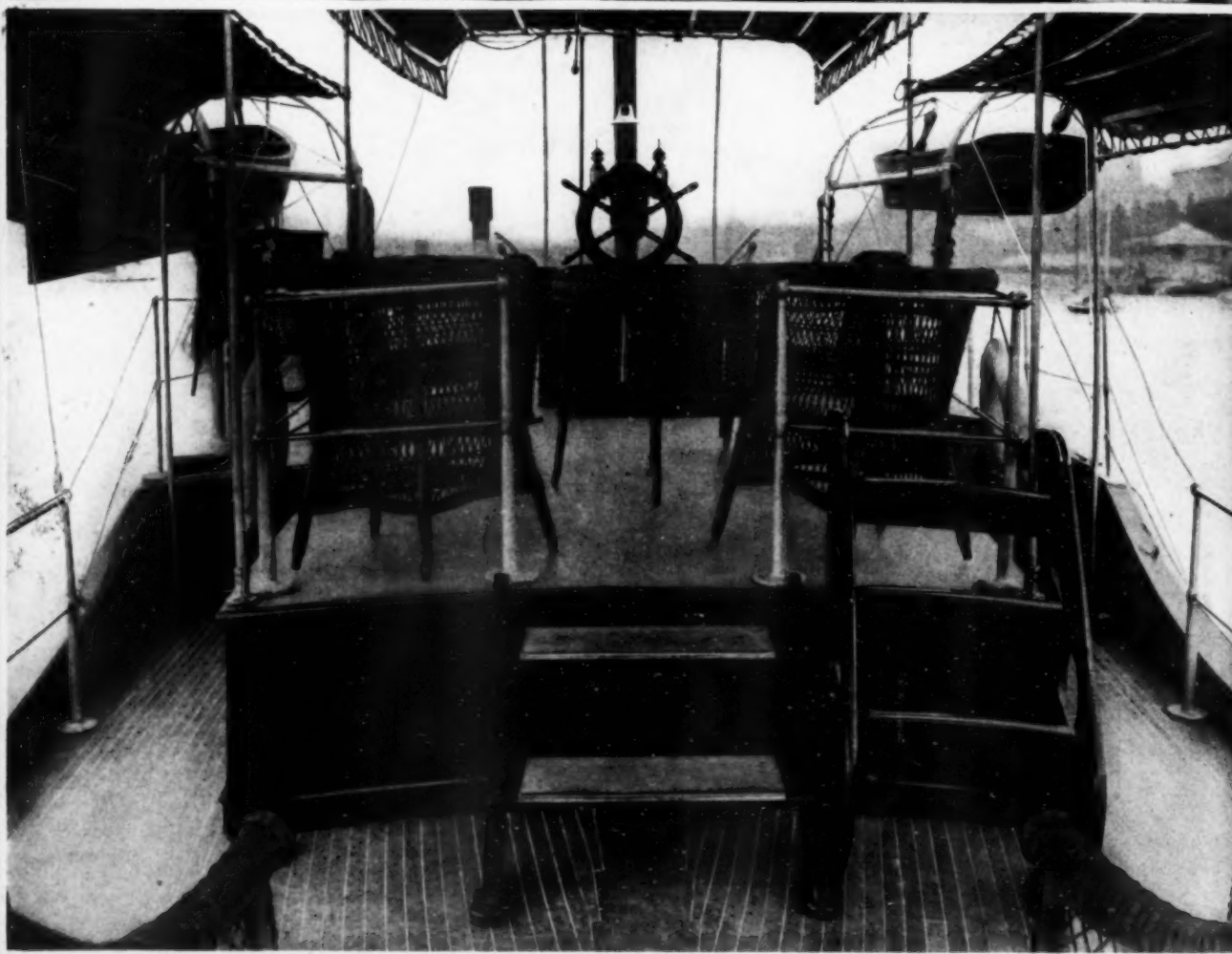
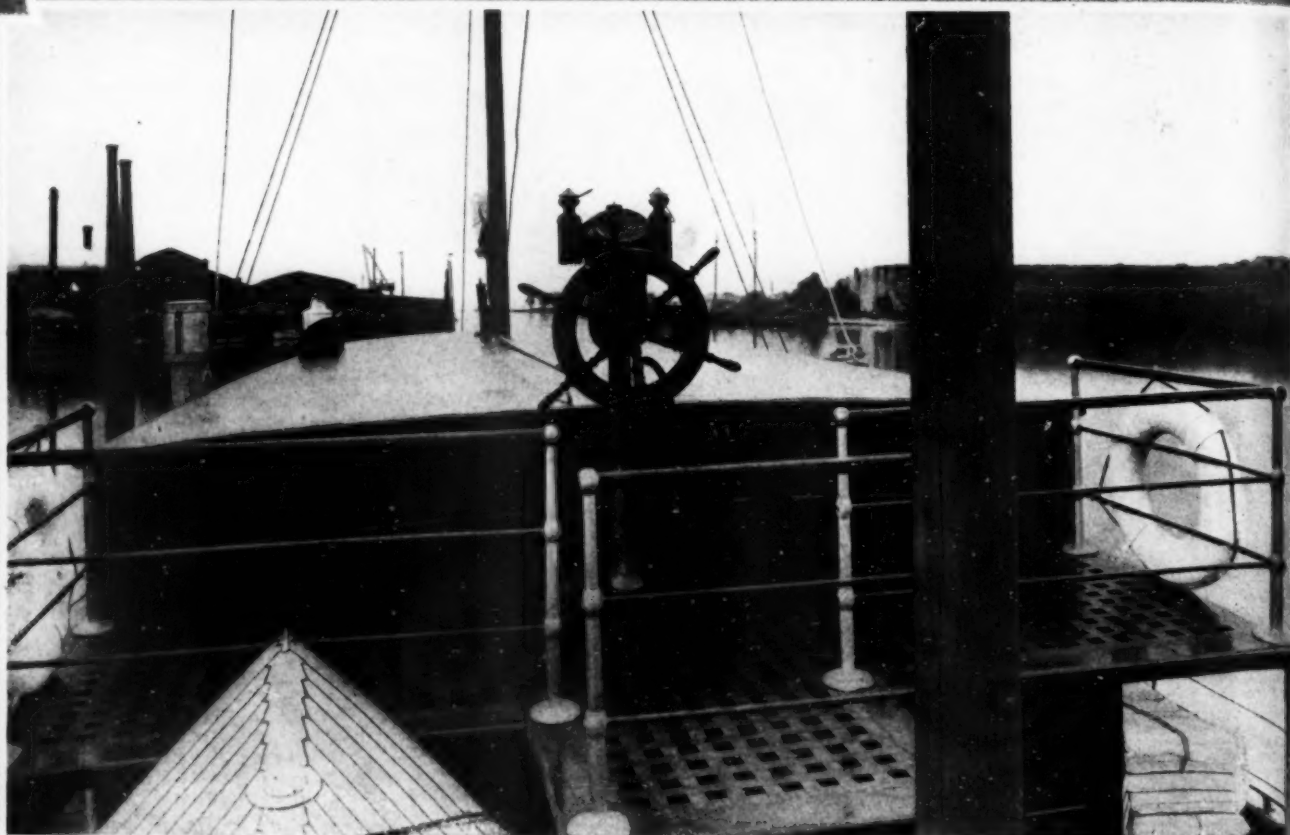


Above, the after cockpit, still retained on some of the larger boats; below, the flush after deck of a big one, with raised sides extending, as bulwarks, nearly to the stern.

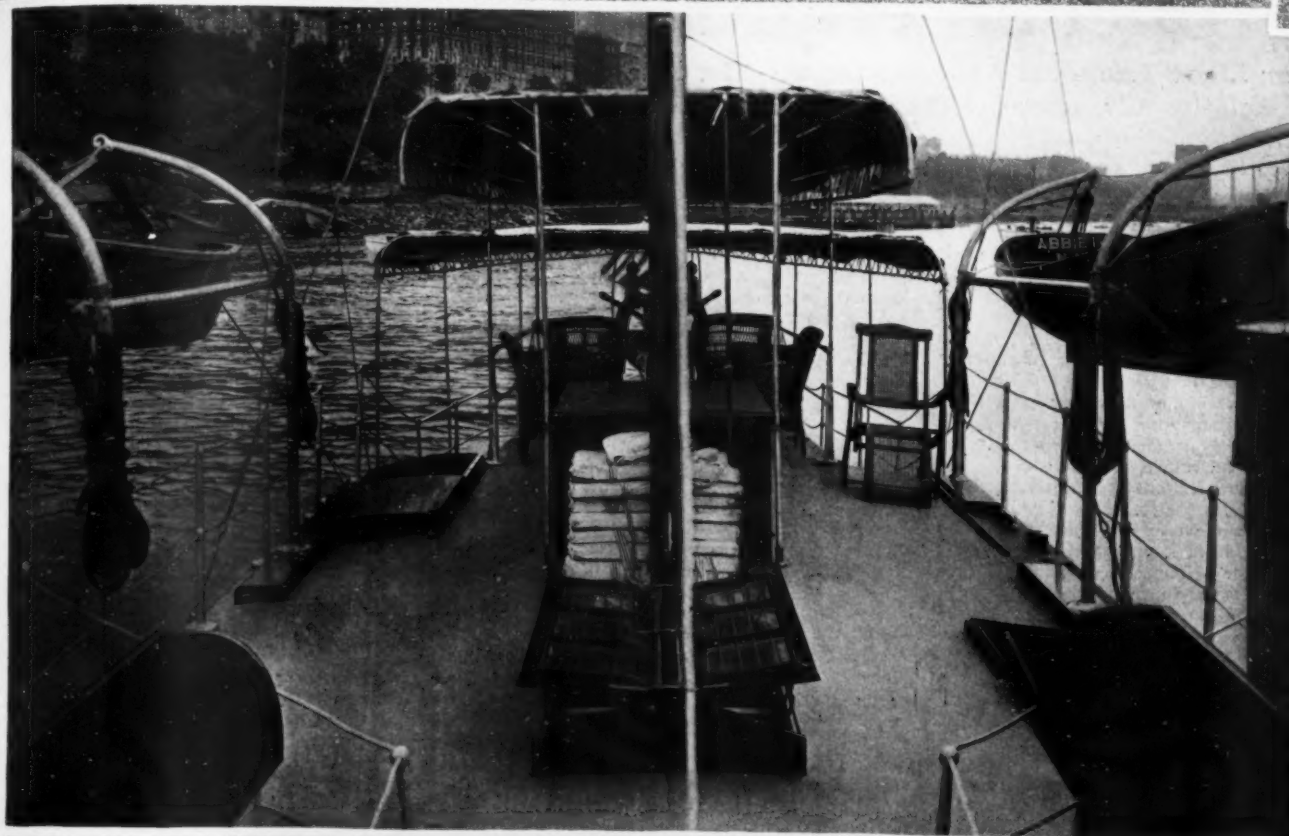
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Above, the raised bridge deck aft of the deck house; below, the cabin trunk used as a bridge deck.



Two views of the same boat showing small deck house protecting steersman's position.

Propeller Points and Problems.

Stream Lines Frictional Wake and Depth—The Principal Considerations in Propeller Location. The Relative Advantages of the Single Screw and Multiple Screws in Various Combinations.

By Thomas L. White.

GIVEN such propeller elements as pitch, area, size and speed of rotation, the principal remaining efficiency factor is location. It follows that the question of the comparative merits of one, two or more propellers is in a large measure independent of tonnage consideration, for propeller positions which are best on a small boat will, other things equal, be best on a large one. That circumstances will not always permit of the most advantageous propeller arrangement is beside the question of efficiency as such.

In the present article, matter from the Engineer, the Transactions of the Institution of Naval Architects, and other sources, has been freely used without much regard to the size of vessel to which it primarily related. It is hoped that the account given of the principle of co-axial contrary turning screws, due originally to Ericsson and recently endorsed by Rota and Greehill, may lead to a test on the power boat.

When a ship is towed, the backward thrust on the wetted surface forward of the maximum mid-section of the hull is very nearly balanced by the forward thrust on the wetted surface aft. This is due to the water displaced by the motion exerting fluid pressure on the stern as it closes in around it. Any cause which interferes with this sternward "stream line" flow and reduces the resultant forward thrust on the stern will leave the backward pressure on the bow partly unbalanced and to that extent augment the total resistance to the ship's motion.

However advantageously a propeller may be located, some interference with the stream line flow around the stern seems to be unavoidable, and the resulting power loss, known as the *thrust deduction*, may, within ordinary limits of practice, be as low as four; or as high as forty, per cent. of the "tow-rope" resistance. In one extreme case, in which the stern was very abrupt, and the screw fitted right up to the stern post, it is on record that the ship refused to go ahead at all, the increase of unbalanced pressure at the bow being greater than the forward thrust developed by the propeller.

Besides "stream lines," the wake of a ship also consists of water which has been entrained by the friction of the moving hull and has thereby acquired a following-up motion. This is known as the *frictional wake*, and just as it is undesirable that the propeller should draw on the stream line wake for its water supply, so it is desirable that the frictional wake should be utilized and its energy converted into useful thrust. Of course, with an ideal boat there would be no frictional wake at all, but since it exists and represents motor output, it is an object so to locate the screw that a part at any rate of this lost work can be recovered.

A third factor relating to screw location and propulsive efficiency is depth of immersion. It is an experimental fact that a propeller is more effective, the greater the depth at which it works. One reason for this is that deep immersion ensures a supply of "solid water," i. e., water which is free from admixture with air bubbles. Another is that a deep-seated screw can be run faster without cavitation setting up, there being a better head of water to fill up any vacuous spaces which tends to form behind the blade tips. It is also clear that good immersion prevents racing by making the screw independent of surface conditions.

Between single and twin screws efficiency honors seem to rest easy. If two screws placed one under each counter fail to a large

extent to utilize the frictional wake, this having more or less the character of a surface current, they enjoy the compensating advantage of being better set back out of the stream line flow, and the thrust deduction is therefore smaller. Moreover, in the matter of racing, they are less affected by pitching than a screw located behind the rudder post, while, even with extreme rolling, it has been proved by experience that they are seldom uncovered.

It is a point against twin screws that the necessary supports projecting from the hull constitute an additional source of resistance to the ship's progress. In the case of the motor boat, however, this debit item is not very serious for the propellers used are light enough to allow of the extension of the shaft bearing right out to the boss. There is thus no necessity for brackets or stays or other special supporting means.

While propeller vibration is perhaps best regarded as an element in the total vibration of the motor and its connections rather than as an independent phenomenon, it is noticeable that with twin screw service the running is quieter. This is because the pressure distribution over the blades is more uniform owing to the elimination of frictional wake, of cavitation, and of broken water. Also, since the installation of twin screws virtually demands the use of two-power plants, the operation of these can be so synchronized that the vibrations set up by the one are neutralized by the vibrations set up by the other.

The question of the relative efficiency of one or more screws must be distinguished from the question whether in a given case one or more screws should be fitted. In other words, there may be reasons aside from economy of output which demand a multiple system of propulsion. In this case the efficiency problem reduces itself to one of so locating the number of screws decided on that they may give the best result.

For example, twin screws may be called for because the draft of a boat is too light to permit of the use of a single propeller large enough to give the desired thrust. Or again, especially with racing craft, even if the draft be ample, the power may be too great to conveniently be transmitted by means of one propeller shaft. Then the character of the engine counts. Like the steam turbine, the explosion motor lends itself to high rotative speeds, and if power is to be sought in the direction of increased engine weight, the necessary corollary is two or more small fast screws with a small pitch rather than one large, slow screw with a large pitch. Economy of machinery space is also a factor. Just as with turbines the use of multiple propulsion prevents inordinate length of the engine room, so with explosion motors, both head space and length are saved by dividing the power plant into smaller units of moderate height placed side by side. Lastly, ease of maneuvering and reliability count for something. With twin screws quicker turns can be executed and there is less likelihood of a total breakdown, for if one power unit be put out of commission, the other can still be operated. On the other hand, it must be conceded that when entering docks and in narrow waters screws located under the counters are more exposed to damage than a screw placed behind the rudder post, where it is comparatively protected.

The report is current that during one of her crossings the *Mauretania*, after losing one of her propellers, was able to proceed with undiminished speed with the aid of the remaining three. Conceding that after the ac-

cident these would enjoy a larger share of the total horsepower, it is still probable that the utility of the fourth propeller was more than questionable. In some trials made at Brest by the French Naval Department, with a one in ten scale model of a battleship fitted with triple screws, it was found that when all three propellers were located in the same vertical plane, the one situated behind the stern post contributed nothing to the work of propulsion. With another arrangement in which the plane containing the side propellers was slightly in advance of the plane of the central propeller, better results were obtained. The conclusion arrived at in these experiments was that with an equal depth of immersion two propellers were equivalent to three, the total blade area in each case being the same, and each system being disposed to the best possible advantage.

It is evident from the two instances given, and there are many others, that the step from two screws to three and from three to four introduces a new element in screw efficiency which is absent in the case of the single screw and practically absent with twin screws. At one time the trouble was supposed to be due to aspersion, a term covering the effect on a screw of having to run in the propeller race from one or more screws situated ahead of it. This explanation is now, however, abandoned, chiefly because it has been shown that with two screws turning in the same sense on the same axis, the loss of efficiency in the sternward screw does not exceed 10 per cent. of its efficiency when running alone.

What really happens is that when more than two propellers are in use they fight for the water in front of them and thus unduly interfere with the normal stream line flow. It has been experimentally proved that a propeller draws water from every point-situated ahead of the vertical plane in which it turns and in the case given above where three screws were situated in the same vertical plane, the decrease of forward pressure on the stern due to the action of the central screw, was sufficient to cancel the whole thrust developed by it. When the two side screws were placed farther ahead the condition was evidently better for the stern screw was then able to utilize some of the water on which the other screws had acted. In view of interference, the prevailing idea seems to be that, considered strictly from the standpoint of efficiency, two propellers are better than three and three than four. When four are fitted it is usual to make the two aft turn outward at the top and the two forward inward, but this rule appears to rest entirely on the results of experiments made with models in tanks.

The most recent idea in screw propulsion is to place two screws on the same axis at the stern and to rotate them in opposite directions, the thrust developed by either, of course, being sternward. As a modern conception this arrangement is a development of the turbine screw of Thorneycroft, in which the water as it flows to the propeller is directed by the constraint of a casing lined with guide blades, so that the angle of incidence as it strikes the propeller blades is determined. The forward contrary rotating propeller produces a similar effect, with the additional advantage that there is less final rotation of the wake.

Lieut. Col. G. Rota, the Italian Admiralty expert and well known for his researches in connection with wave motions in canals, has made an exhaustive experimental investigation of the relative advantages of a single

(Continued on page 74.)

Talks With Our Naval Architects.

Harold Lee.

HAROLD LEE, of the firm of Lee & Brinton, naval architects of Seattle, Wash., is another of the graduates of the Sheffield Scientific school of Yale University who made a pronounced success in the designing and construction of power boats, and many of the successful boats on the waters of Puget Sound had their conception in the offices of Mr. Lee and his partner.

Mr. Lee graduated from Sheffield in 1896 and then entered Cornell for a year's course in naval architecture, graduating in 1897 with the degree of M. E. He then decided on another year of study there in order to work out a few theoretical problems that he had started and was not ready to further as being absolutely feasible. After solving these to his satisfaction he went to the old Roach Shipyard on the Delaware at Chester, Pa., where he was employed first as a mechanic in the yard and afterwards in the drawing room. From there he went to the drawing room of the Crescent Shipyard and afterwards to that big practical school of naval architecture on the New Jersey shore of the Delaware, the New York Shipbuilding Company.

In 1902 Mr. Lee with some other associates became actively interested in a yacht building plant in New York where they built a great many well-known and successful power boats and larger craft. He also dabbled in the dry dock and repair business until 1906, when he went to the Pacific coast on a visit. While at Seattle he became much impressed with

the opportunities of his profession on Puget Sound and at once opened an office as naval architect there. In 1907 F. S. Brinton who had been associated with him in the East,

to my knowledge a single modern power boat in these waters, but since that time there has been a rapid development and now Puget Sound can boast of a very respectable fleet although not at all proportionate in numbers to the wonderful opportunities afforded for cruising in waters whose scenic beauties are unequalled anywhere in the world.

"Climatic conditions are such that the popular types of cruisers designed and built in the East are not suitable on Puget Sound or on the Coast and there is a tendency towards developing a local type of boat adapted to the special conditions, for which a pilot house is the most necessary feature. Long distance racing is becoming very popular out here on the coast and will undoubtedly lead to further developments of both hull and machinery. The present racing rules encourage a healthy form of hull as shown in past contests when the obsolete types on the Sound and 'home made' designs have been hopelessly out-classed."

Mr. Lee has made a specialty of cruisers and two of his best known boats are Soya, which has won much fame in the International races on the Pacific coast, and Vigilant, known as the first raised deck cruiser built with a pilot house and the forerunner of a now popular type. During the past year there has been very little call for cruisers on the coast, and Lee & Brinton have turned to the commercial classes, such as tow boats, fishing schooners, and freight boats

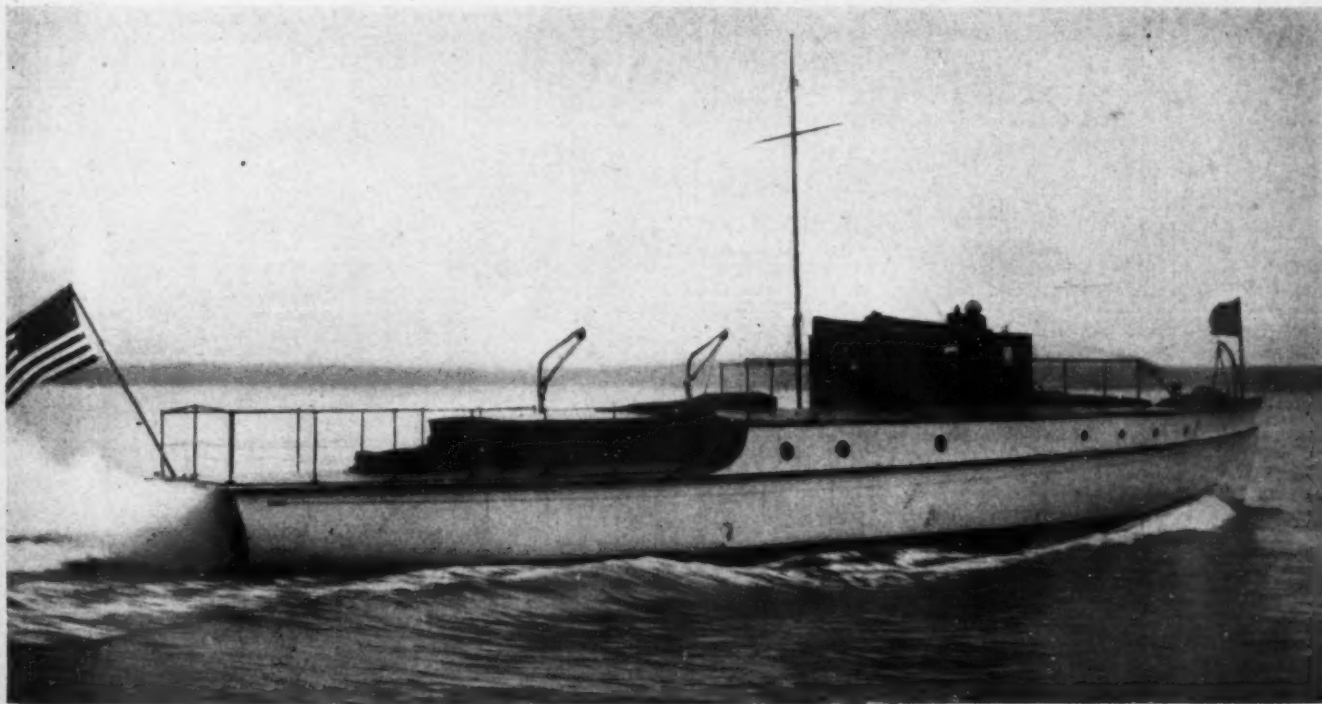
for the time being and have produced several notable craft in which the one-man control has been installed.



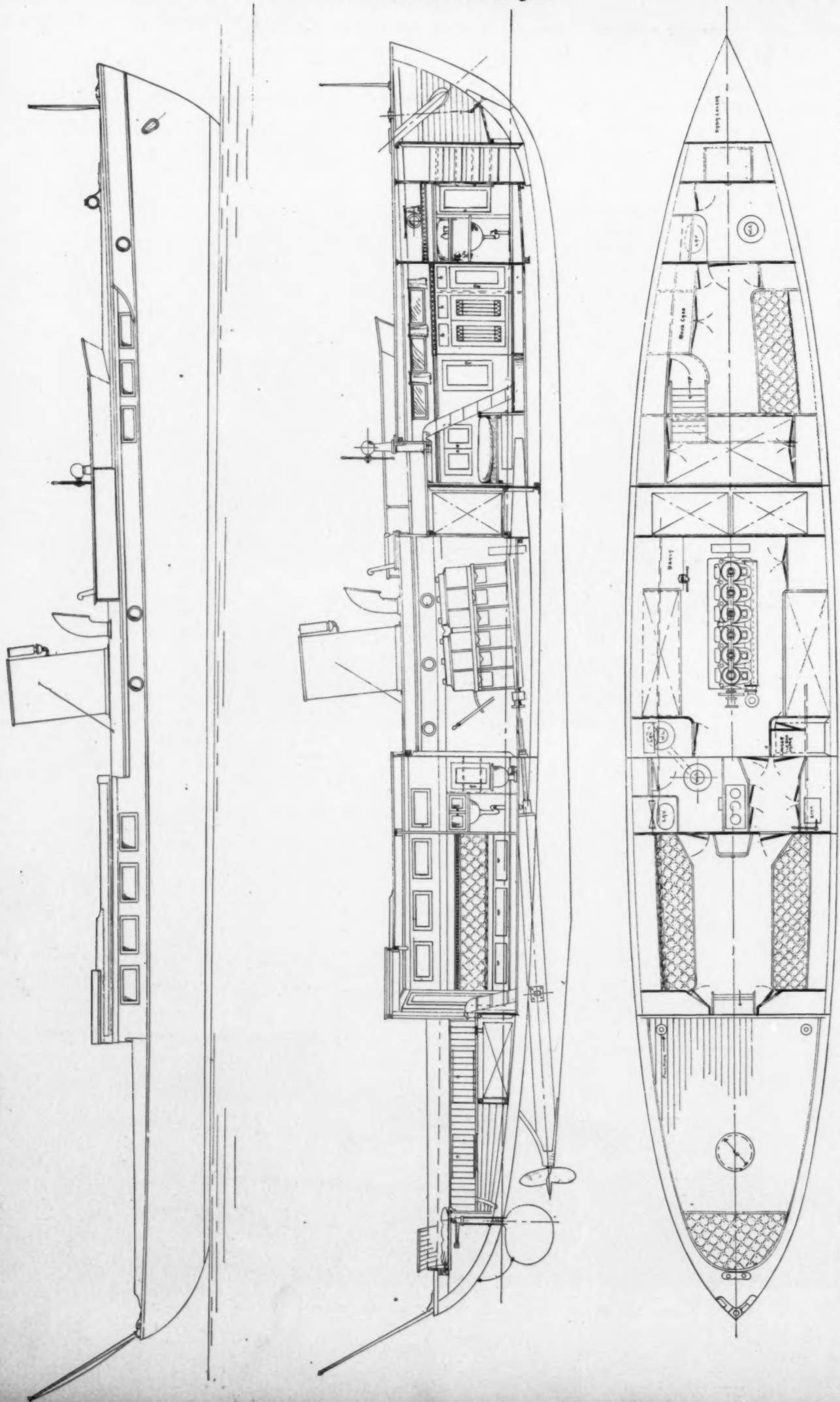
Harold Lee, Naval Architect.

joined him.

"Five years ago," said Mr. Lee to a representative of MOTOR BOATING, "there was not



Vigilant, inspection launch of the U. S. Engineers at Seattle, is said to be the first raised-deck cruiser with a pilot house, built on Puget Sound. She was designed by Mr. Lee and was the forerunner of a now popular type.



The 67-foot bridge deck cruiser, designed by Messrs. Swasey, Raymond & Page, of Boston, will be used principally for fast day service. Note how the deadwood has been cut away above the shaft to provide for a better flow of water to the propeller.

New Motor Boat Designs.

MESSRS. Swasey, Raymond and Page, of Boston, have recently completed the design, which appears on the opposite page, of a 67-foot motor yacht that will be used for fast cruising and ferry service on Long Island Sound and upon the Hudson River.

The new boat will be 67-feet overall, 59 ft. 6 in. on the water line, with 11 ft. 6 in. beam and 3 ft. 6 in. draft. She will be built strongly but lightly of the best material, and it is expected that with the 100 h. p. Standard motor with which she is to be equipped, she will do in the neighborhood of 18 miles per hour.

In design she is of the bridge deck type with raised sides forward and cabin trunk carrying the deck line to the bridge deck. There is another cabin trunk over the engine room and a slightly higher one over the main cabin aft. A large cockpit occupies the stern of the boat and there is a seat across the after end. The bridge deck is sunk somewhat below the level of the raised deck forward and is about on a line with the sheer strake. This deck is protected by a break-water forward and a rail to which spray clothes may be attached. There is a seat across the after end

A 67-Footer.

of this deck and just aft of it are two cowl ventilators and funnel.

Although intended primarily for day cruising the interior lay-out shows all the necessities and conveniences for more extended trips. There is the usual chain locker in the extreme bow, aft of which are a storage space, with drawers and a toilet room the full width of the boat. From this point to a bulkhead beneath the bridge deck, extends an exceptionally large, full width stateroom with a companionway leading to the bridge deck. This compartment is well lighted by the drop sash windows in the trunk side and is equipped with an exceptionally large berth, a transom, a large book-case and several lockers.

Occupying the remainder of the space beneath the bridge deck there is a compartment separated by water-tight bulkheads both from the stateroom and from the engine room, in which are installed the two gasoline tanks. This fuel storage installation being almost amid-

ships, will cause no change of trim, as the gasoline is used.

The engine room is amidships, and is well ventilated by the cowls, stack and ports. In this compartment are a bench, a large locker, and berths along either side to accommodate the crew. There is also a toilet room for the crew.

Occupying equal spaces to starboard and port respectively are a galley, and a toilet room, next aft. The former connects with the engine room and the main cabin aft so that there is free access from the after part of the boat to the engine room. The after cabin is provided with transoms along either side which may be used as berths, also with ample locker space. There is a companionway amidships to the cockpit which occupies the after end of the boat. The finish below is in white enamel and mahogany, and the exterior of the cabin trunks is of teak throughout.

An extremely interesting feature of the boat is the manner in which the dead-wood has been cut away above the shaft just forward of the wheel, in order that there might be an unobstructed run of water to the propeller.

A 48-Foot High Speed Cruiser

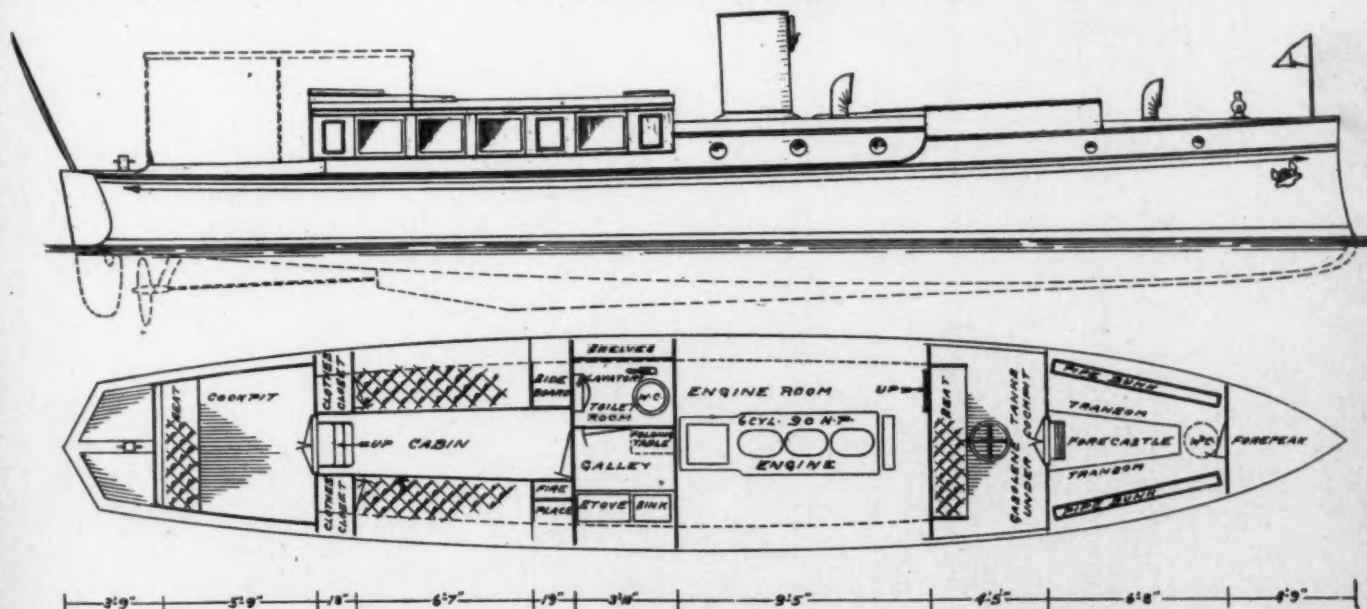
THE profile and plan below are of a high speed bridge-deck cruiser designed in the office of Arthur P. Homer, 88 Broad Street, Boston, for a yachtsman who desired a boat for short cruises and day trips. The owner also demanded comfortable and convenient quarters for the crew, comfortable living quarters and sufficient deck space for six or seven guests. The boat is to be able to weather any ordinary summer storm and was to serve in the dual capacity of tender to a racing yacht and of private ferry between summer home and city, a distance of approximately 18 miles.

The boat is a combination of the raised deck and trunk cabin types which gives her a good free-board forward and a light and airy cabin aft, and there is a bridge deck forward. The principal dimensions are length over all 48 ft. 6 in., beam 8 ft. and draft over all 3 ft. 2 in. and draft of hull 2 ft. 5 in.

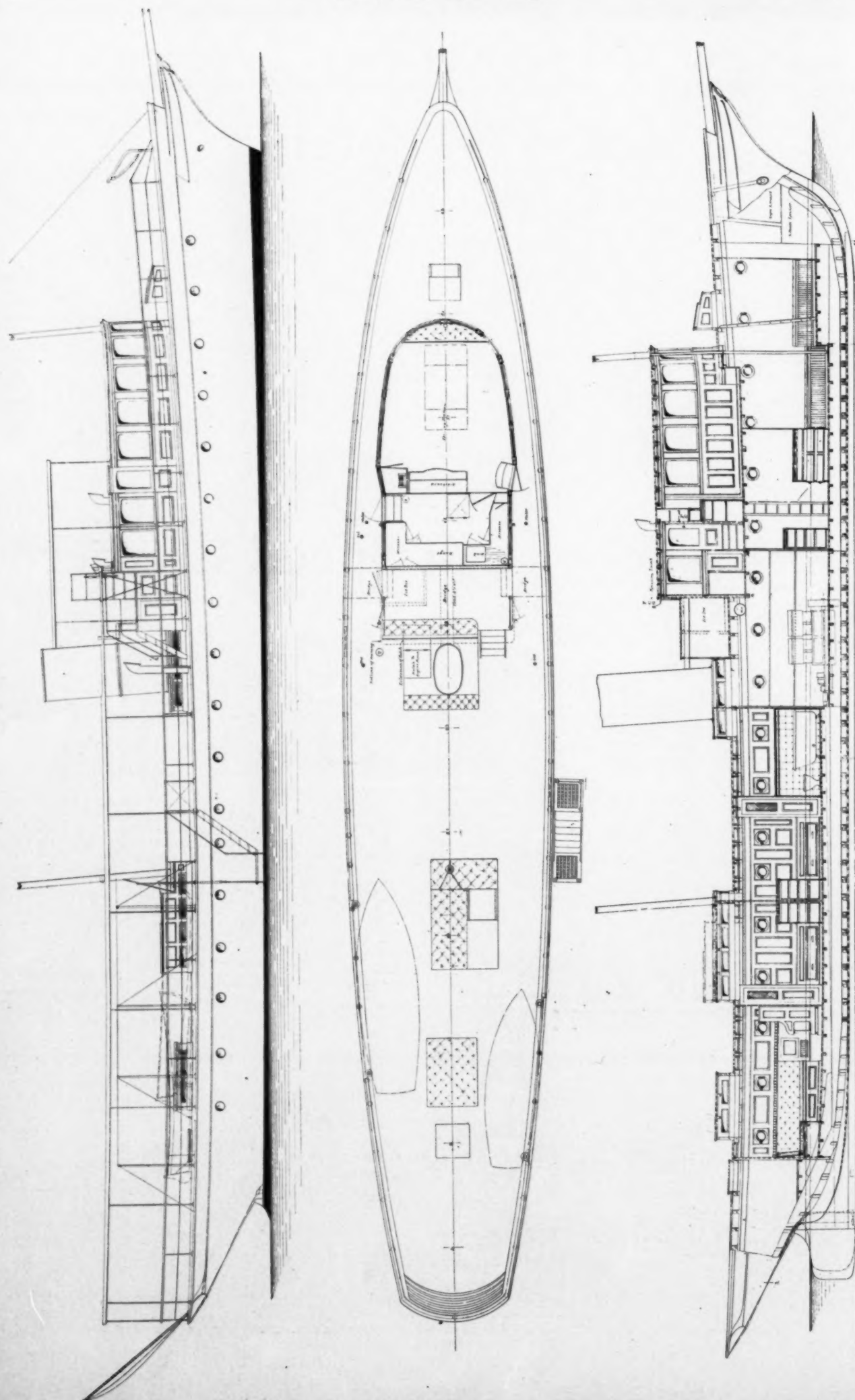
The boat has the ram bow and the "V-transom" or Normand type of stern racking slightly aft, and with her long low lines has decidedly the appearance of speed. The dead-wood is cut away aft as is the common practice abroad, thus giving an unobstructed run of water to the propeller. Starting forward below decks the layout is as follows: There is the usual storage space for cables in the bow and a fore-castle with transoms along either side, pipe berths above and a toilet, occupying the remainder of the space below the raised deck. The bridge deck is sunk somewhat below the sheer line and occupies the space next aft. There is an athwartship seat across the after end from which the steering is done by means of a horizontal wheel, and the controls are also led to this point. The gasoline tanks will be installed in the space of low headroom beneath this deck. A companionway leads from the bridge deck to

the engine room which is amidships. This compartment contains the six cylinder 90 h. p. engine and is ventilated by a large stack and cowl besides the ports. The engine will be a Sterling of 6½ in. bore and 8 in. stroke and will develop its rated h. p. at 700 r. p. m. Water tight bulkheads separate the engine room from the parts of the boat forward and aft of it, making the cruiser practically non-sinkable.

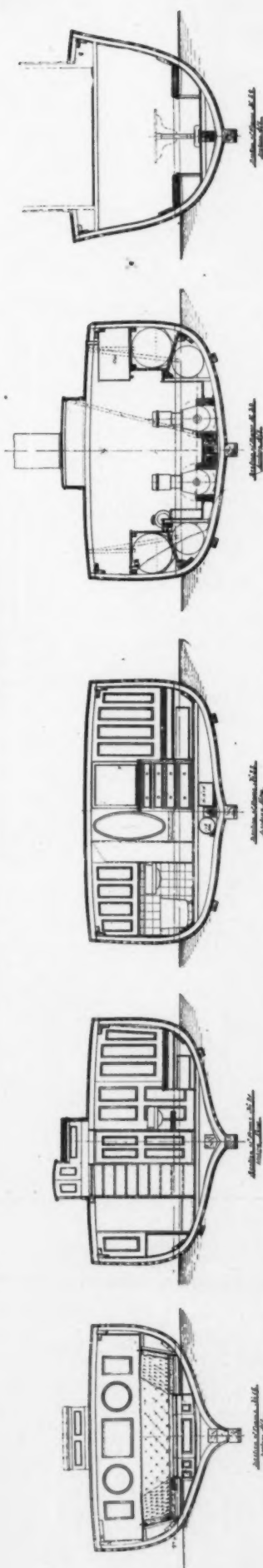
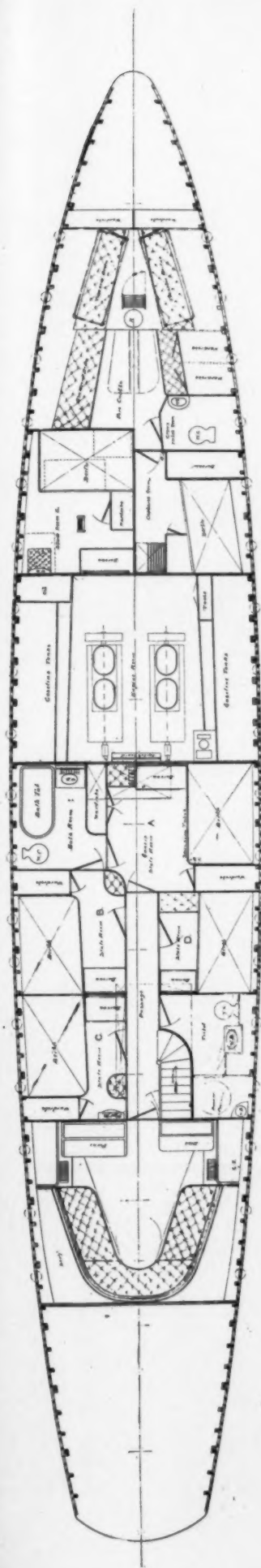
A galley and toilet room occupy corresponding spaces to starboard and port respectively just aft of the engine room and a large cabin occupies the remainder of the cabin trunk. This compartment is provided with a side-board, fireplace, two large clothes closets, transoms along either side and a number of lockers and drawers. There is a companionway amidships, leading to the cockpit aft, under the floor of which is installed the water tank.



The 48-foot day cruiser, designed in the office of Arthur P. Homer, shows an interesting combination of the ram bow and Normand stern.



Recmar II., the 98-footer designed by Messrs. Cox & Stevens, and which is now under construction at the yard of the New York Yacht Launch and Engine Co. for Mr. R. E. Olds, of Lansing, Mich., has the clipper lines of the steam yacht.



The sections of the Reomar II. show but little deadrise, and a heavy keelson has been employed to give the necessary stiffness to the hull. Note the use of bilge keels.

Reomar II, a New 98-Foot Motor Yacht.

MESSRS. COX & STEVENS have recently placed an order for the construction of a large flush-deck twin-screw motor yacht from their design, which will be named Reomar II, and a boat to their design is under construction at the works of the New York Yacht, Launch & Engine Company. This boat was ordered by Mr. R. E. Olds, of Lansing, Mich., and is the third boat that Mr. Olds has had designed for him by the same architects and built by the same builders within the last three years.

The principal dimensions of Reomar II are: Length over all, 98 ft.; length on water line, 80 ft. 6 in.; beam, 16 ft. 6 in.; draft, 4 ft. These dimensions are the maximum possible for use in the Erie canal, the owner wishing to be able to use his vessel either on the Lakes or the Atlantic Coast. Having this in mind the height of the deck house above water has been kept within the allowable measurements under bridges in the canal and the stack and masts are portable, so that they can readily be taken down.

In type the new Reomar II is a conventional modern steam yacht, with moderately overhanging bow and stern, good freeboard, pleasing sheer and well-turned ends. In order to give as much deck room as possible, the vessel will be of the flush deck type, having over each living space a large skylight for ventilation, as well as air ports of ample size.

The hull is being built in the most substantial manner—the keel dead wood and frames being of oak, planking yellow pine, all fastenings being of copper or composition. As the draft is not very great in proportion to the beam, the designers have worked over the frames an unusually heavy keelson to give the necessary strength to the structure and enable the vessel to take the ground without damage. The exterior appearance will be attractive, the deck house, which is quite long for a vessel of this size, being of mahogany and recessed into the deck, thus reducing its apparent height. Mr. Olds, by reason of his large experience in vessels of this type, has learned just what is and what is not important for comfort and reliability, and the designers

in working out his ideas have produced a most practical as well as comfortable and attractive craft.

The vessel is twin screw, having two 60 horsepower, 4-cylinder, Twentieth Century engines installed in a central water-tight compartment entirely separated from the rest of the craft by oil-tight bulkheads and having separate means of access from the deck. In this compartment are placed the gasoline tanks of a total capacity of 800 gallons, thus insuring a large cruising radius, and further containing a complete electric light plant with independent gasoline engine, the generator being sufficiently powerful to light the entire vessel and also operate a powerful searchlight.

The accommodations for the owner and guests, below decks, consist of five comfortable sleeping cabins, two bath rooms, and a large saloon which can readily be made up into a double bed room, thus affording comfortable sleeping accommodation for twelve persons. One of these staterooms is placed forward of the engine room on the port side and is accessible from the dining room, all the other rooms

being aft of the engine space.

The finish in the living quarters below deck aft will be Colonial in character, with doors, furniture, chairs, etc., of mahogany, while the bulkheads, sides of vessel and deck overhead will be finished in white paint.

The accommodations for the crew are all forward of the machinery space, and consists of a separate stateroom for the captain, with built-in berth, bureau and wardrobe, a mess room in which cook and steward have their berths, forecabin, with accommodation for four men and a separate toilet.

The deck house, which, as stated, is unusually large, contains in the forward portion a dining saloon of sufficient size to comfortably accommodate twelve persons. The after portion of the deck house is utilized as a galley and has a communicating door, so that the meals can be readily served to the dining room, and also through a hatch in the galley floor food for the crew can be conveniently sent below. Reomar II will be delivered to her owner in the coming spring.

Hobo, a 40-ft. Auxiliary Schooner.

THE Profile and plan below and the lines on the opposite page are of a 40-foot auxiliary cruising schooner recently designed by George H. Hitchings, of Berkeley, Cal. She will be used on San Francisco Bay and its tributaries and will make occasional outside trips.

The boat is strikingly original in design, being a combination of the schooner rig and the raised deck motor boat. As will be seen the sail area is considerable and considering the strong winds that prevail on San Francisco Bay should be sufficient to drive the boat under almost all conditions. For wind-

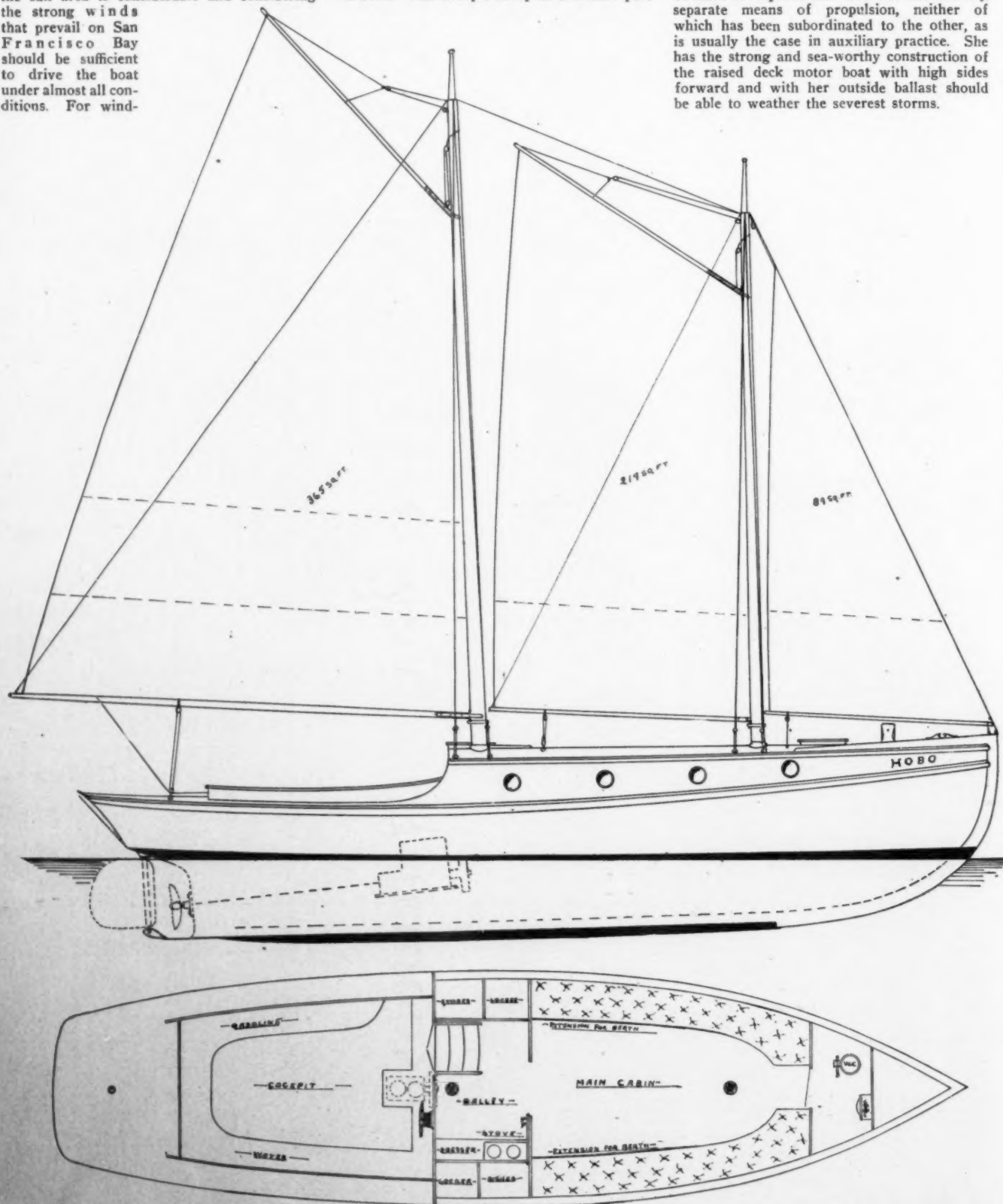
ward work and for times when it is undesirable to use the sails a 15 to 20 h. p. medium weight engine is being installed which should drive the boat at a very good cruising speed.

Below decks the accommodation is similar to the usual motor boat practice, there being a galley, dresser, etc., in the after end of the cabin, a saloon forward of this with extension transoms along either side and a toilet room forward. The cockpit occupies the after part

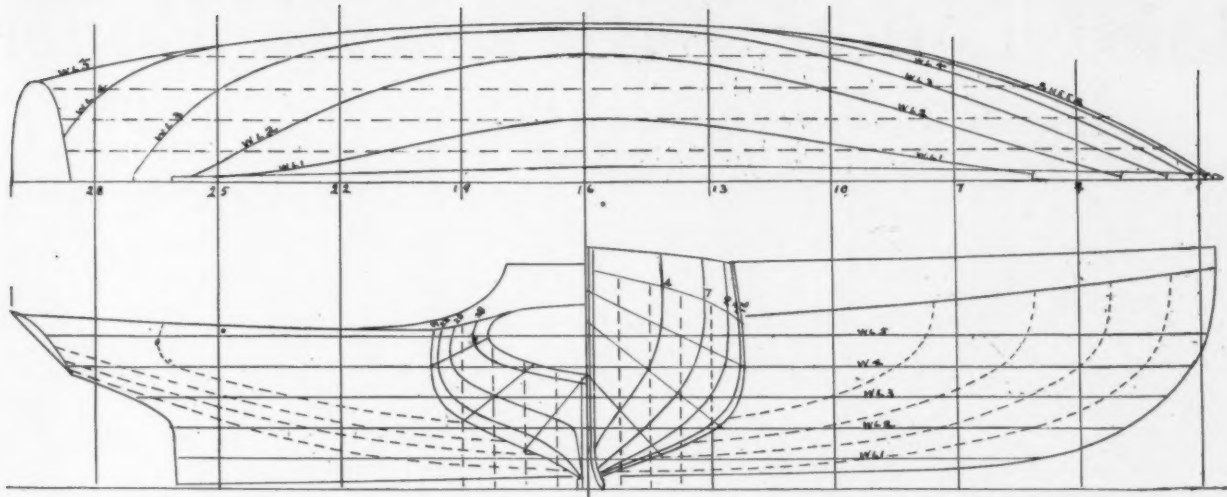
of the boat and the gasoline and water tanks are installed beneath the seat which runs completely around it. The motor is installed beneath a raised portion of the cockpit floor and occupies very little valuable space.

The total spread of canvas is 673 sq. feet, distributed as follows: jib, 89 sq. feet; foresail, 219 sq. feet, and mainsail, 365 sq. feet.

As an all-round boat to be used by a small party for extended cruising this model would be hard to improve on. She has two entirely separate means of propulsion, neither of which has been subordinated to the other, as is usually the case in auxiliary practice. She has the strong and sea-worthy construction of the raised deck motor boat with high sides forward and with her outside ballast should be able to weather the severest storms.



Hobo is an interesting combination of the schooner rig and the raised deck cruiser, and she can be handled equally well under power or sails.



The lines of Hobo's underbody show the influence of the schooner more strongly than does her profile.

A New Bridge Deck 40-Footer.

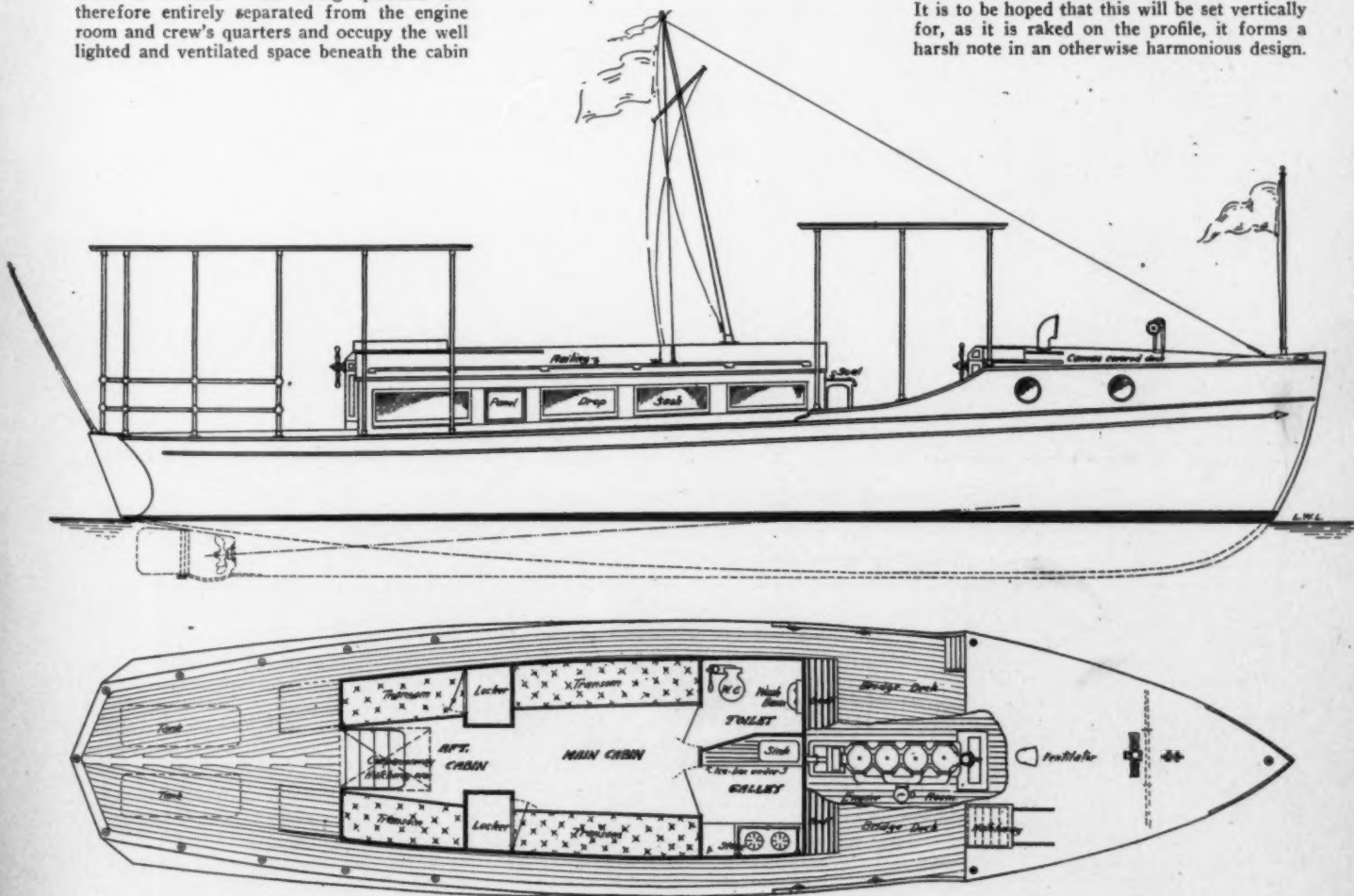
A RECENT design from the Tarrytown Boat Works, Tarrytown, N. Y., is shown below. The boat will be of the bridge deck type with raised deck forward and flush deck aft and her general dimensions are length over all 39 ft. 9 in., length on the water line 37 ft., beam 9 ft. and draft 2 ft. The boat is of a type that is becoming quite popular, as in it a very convenient interior arrangement is possible. The fore-castle is forward under the raised deck and the motor is installed under the bridge deck where the head-room is limited. The living quarters are therefore entirely separated from the engine room and crew's quarters and occupy the well lighted and ventilated space beneath the cabin

trunk. In the forward end of the latter are a toilet room and a galley occupying corresponding spaces to port and starboard and just aft of these is the main cabin with transoms along either side, which may be used as berths. Two large lockers on either side of the passage separate this cabin from an after one with similar transoms along either side. These extend beneath the after deck so as to form full length berths.

The bridge deck, runways at either side of the cabin trunk and the after deck are all

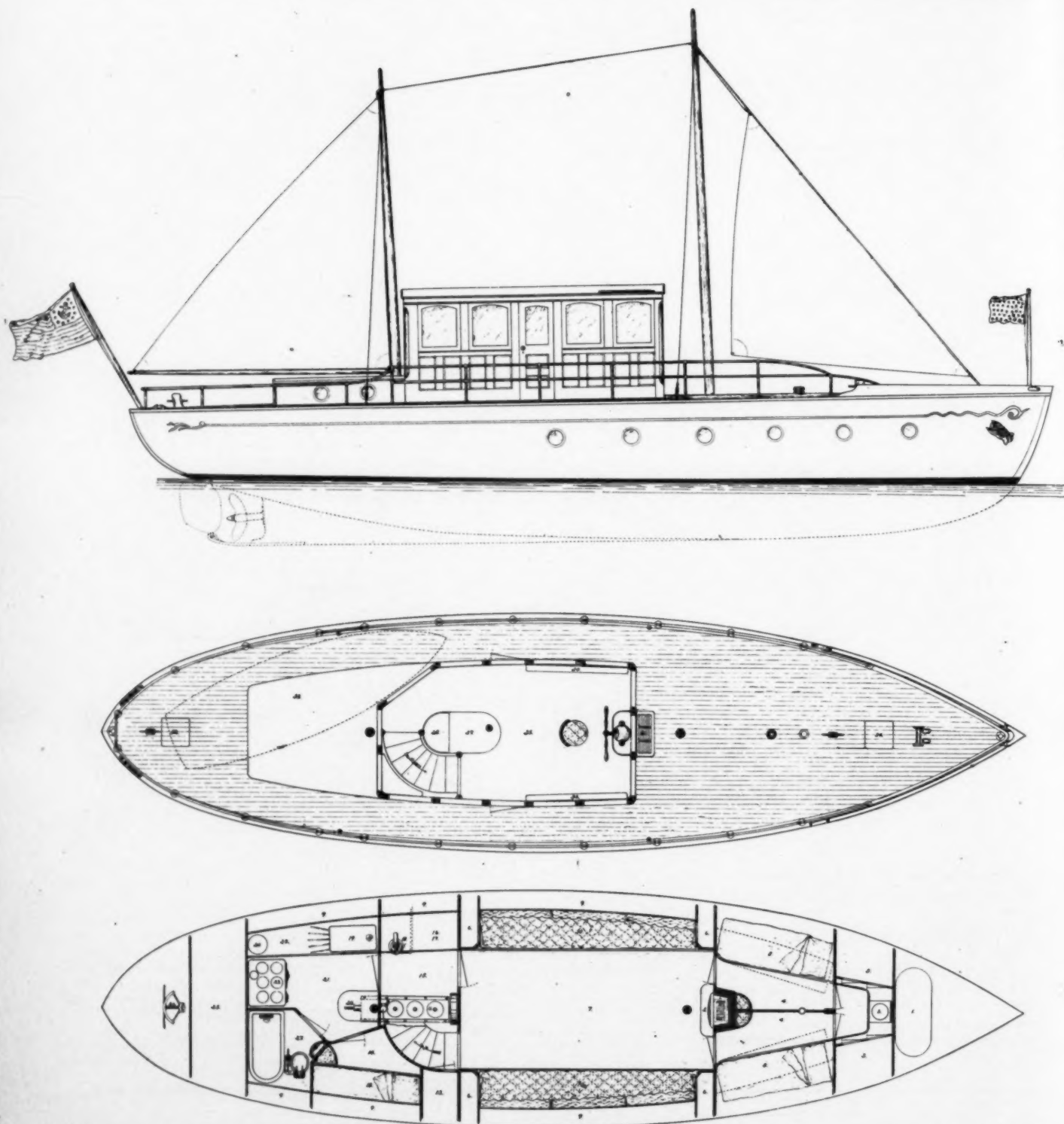
flush with a sheer line and provide ample space for a number of wicker chairs. The cabin trunk may also be used as a seat and quite a number may therefore be accommodated on day cruises.

The boat will be steered and controlled from the bridge deck which is conveniently situated directly above the engine and a duplicate steering gear will be installed at the after end of the trunk so that the boat may be handled from the after deck when desirable. Standing awnings are provided above both decks and a mast will be stepped on the cabin trunk. It is to be hoped that this will be set vertically for, as it is raked on the profile, it forms a harsh note in an otherwise harmonious design.



The new Tarrytown 40-footer has the raised deck forward with flush bridge deck and after deck. Note the double control.

A 50-Footer With a Deck House.



The midships deck house is the exceptional feature of the Seaman 50-footer and will be the navigating and social centre of the boat.

THE original 50-footer of 13 ft. draft shown below in plan and profile is a recent design of the Seaman Motor and Launch Works of Long Branch, N. J. The boat is of the flush deck type, and the deck house amidships is a striking and exceptional feature in this size boat.

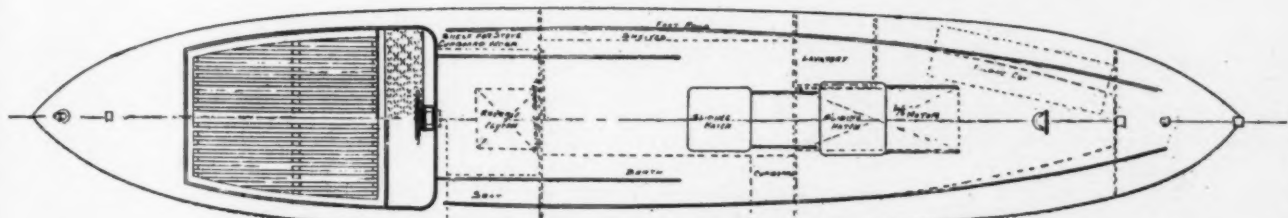
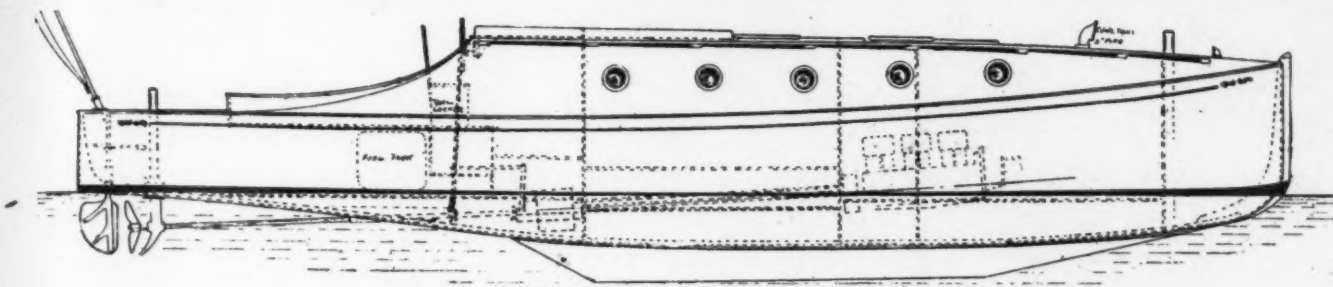
The deck house will be the social and navigating center of the boat, and will also be used as a dining saloon. It has full headroom, perfect light and ventilation, affords an unobstructed view in all directions and may be entered from either side deck without descending. It connects by means of a curved companionway with a large cabin below amid-

ships. This compartment is provided with extension transoms along either side which may be used as berths, ample locker space and an open fireplace in the forward bulkhead. Forward of this are two staterooms occupying equal spaces to port and starboard, and each connecting with a toilet room and large wardrobes forward. A fresh water tank of 100 gallons capacity and the usual chain locker occupy the extreme forward space. The engine is installed just aft the main cabin and to port of it there is a bench beneath which is the ice box. The galley occupies the space to port under the cabin trunk and the space to starboard is divided between a bath room

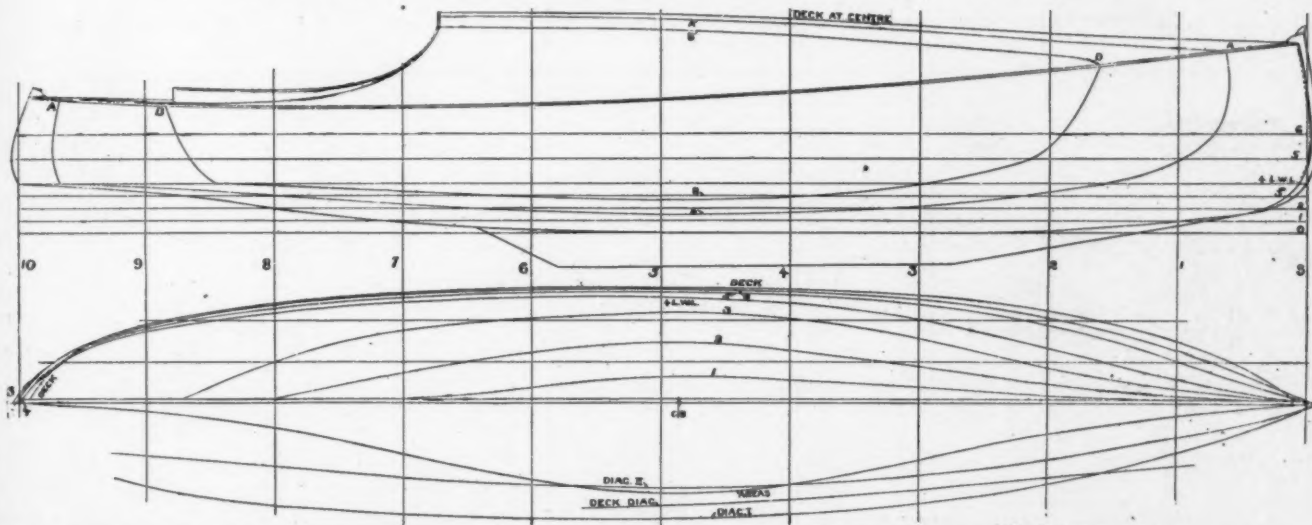
and a small stateroom, the arrangement of which is best seen by a glance at the plans.

The boat will be schooner rigged and will be able to carry a sufficient spread of canvass to steady her in a blow and to give her considerable headway under her sails alone. The boat is evidently intended for northern cruising, and should make a satisfactory one for this purpose. Her deck space is exceptionally large and her deck house affords a pleasant and well protected lounging place when the weather is bad. A 16-foot dory will be carried as indicated by the dotted lines on the deck plan, and in order to accommodate this a corner of the deck house has been cut away.

A Thornycroft 1,000 Mile Cruiser.



The 40-footer with which Mr. Tom Thornycroft will attempt a 1,000 sea mile non-stop run.



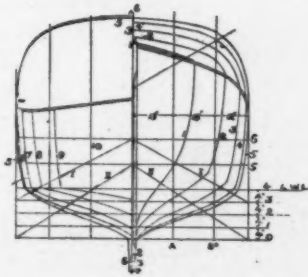
The lines and sections of the Thornycroft boat show a decidedly V-shaped underbody, almost flat aft and with a hard bilge nearly the entire length.

IN order to demonstrate the possibility of making long continuous cruises in a motor driven boat, Mr. Tom Thornycroft of London, is building to his own design a 40-footer, shown above, in which he hopes to make a non-stop run of 1,000 sea miles.

Assuming 10 knots as the average speed it would take 100 hours to make such a run, and this has been the keynote of the design. A 45 h. p. motor will be installed and the problem of carrying sufficient fuel for the run is one of the greatest to be met with. Allowing $4\frac{1}{2}$ gal. per hour as a safe estimate, 450 gallons would be necessary for the run and a 500-gallon tank will probably be installed.

In such a boat one would naturally expect the motor to be installed with the idea of accessibility uppermost, but Mr. Thornycroft has paid the highest compliment to the internal combustion engine by installing it, a 45 h. p. six cylinder Thornycroft, under sliding hatches in the cabin forward, intending that after once started it shall keep going as long as lubricating oil and gasoline are supplied it.

In design the new boat is extremely interesting. To begin with she has the slightly tumbled home stem and stern quite popular in foreign practice, and her underbody is decidedly V-shaped, with hollowed lines forward and almost flat after body with a hard bilge



line throughout almost the entire length. There is a keel amidships cut away forward and aft to facilitate steering. The water lines shows very easy entrance and run and are hollowed at these points. The top sides are nearly vertical throughout the entire length. The sheer is pronounced, and the line of the crown of the deck from the stem to the bulkhead is almost a straight one. There is a small cockpit from a seat at the forward end of which the boat will be controlled.

It may seem at first glance that the motor is installed a little too far forward, but a closer observation will show that the fuel tank of 500 gallons capacity is installed beneath the cockpit floor and the reverse gear, in itself a considerable weight, is also well aft.

the two serving to counterbalance the weight of the motor forward.

A peculiar feature of the interior arrangement and one of which we fail to see the desirability, is that the motor compartment is separated by a water tight bulkhead from the cabin amidships, making it necessary in order to reach the engine, to crawl along the raised deck and drop through the forward hatch. The cabin amidships will contain two large sofa berths and an acetylene cooking stove, acetylene gas being used also for lighting.

If criticized by the standards of the cruiser, the boat is sadly lacking in a number of particulars such as the size of her cockpit and the flat underbody aft. But for the service for which she was designed, where speed is a large consideration and seaworthiness plays no very important part, she will doubtless prove very satisfactory.

The new Thornycroft cruiser is in a number of respects similar to the well known Miranda IV, and is typically a Thornycroft design: the high crowned deck, a curved continuation of the top sides, and the flat pointed after body with almost vertical sides being noteworthy examples. The hull will be constructed strongly but very lightly, and the hydroplane principle of sliding over rather than cutting through the water will be depended upon for a speed of 14 knots.

A 37-Foot Raised Deck Cruiser.

THE plans below are from a recent design by Southmayd Hatch of New York City. They illustrate the popular raised deck cruiser, an exceptionally seaworthy type, inexpensive to build and to maintain.

The interior arrangement is simple and is as follows: The chain locker and gasoline tank occupy the extreme bow and are separated from the stateroom by a water-tight bulkhead. This stateroom is provided with extension transoms with lockers underneath as is also the main saloon next aft and amidships. The passage to the engine room is on the starboard side and the space opposite this

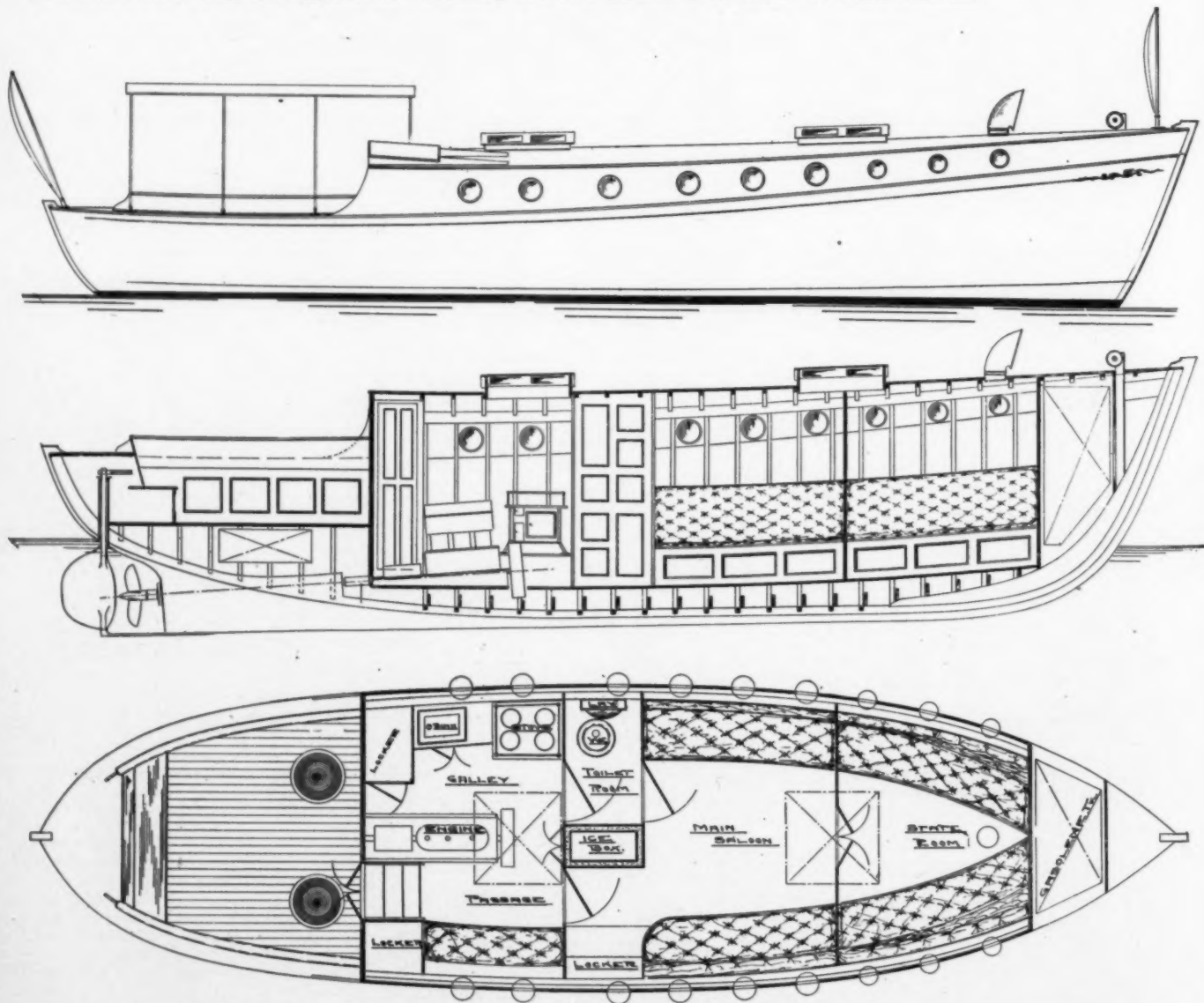
is occupied by a toilet room with an ice box amidships opening into the engine room and galley. The galley occupies the port side of the engine compartment and the companion-way, a locker and an extension transom occupy the space to port. The cockpit, with seat across the after end, occupies the stern of the boat and there is a water tank beneath its floor.

Ventilation has been provided for by numerous swing ports and two sky-lights, one above the stateroom and main cabin and one above the engine room and galley besides a cowl in the deck above the stateroom. An interesting feature of the boat is the icebox

installation. Extending as this does from the floor to the cabin roof it may be filled from a flush hatch on deck eliminating the disagreeable feature of carrying the ice through the engine room as is frequently necessary on boats of this type.

The boat is controlled from the bulkhead, the spark and throttle controls being located at the wheel, making it a one man boat.

The principle dimensions are length over all, 37 ft.; beam, 10 ft.; draft, 3 ft. 3 in.; cabin head room, 6 ft. 2 in. under beams. A 20 h.p. engine is specified, and with this power the boat should make nine miles an hour under favorable conditions.



The 37-footer designed by Southmayd Hatch is of the pure raised deck type and was designed primarily for seaworthiness.

A 125-Foot Commercial Motor Boat.

THE design which appears on the page opposite was recently completed by C. I. Nielsen of Brooklyn, N. Y., for a brick manufacturer of South River, N. J., and is an interesting example of the strides that are being made in the field of the commercial motor boat. The boat in question has the following general dimensions: Length over

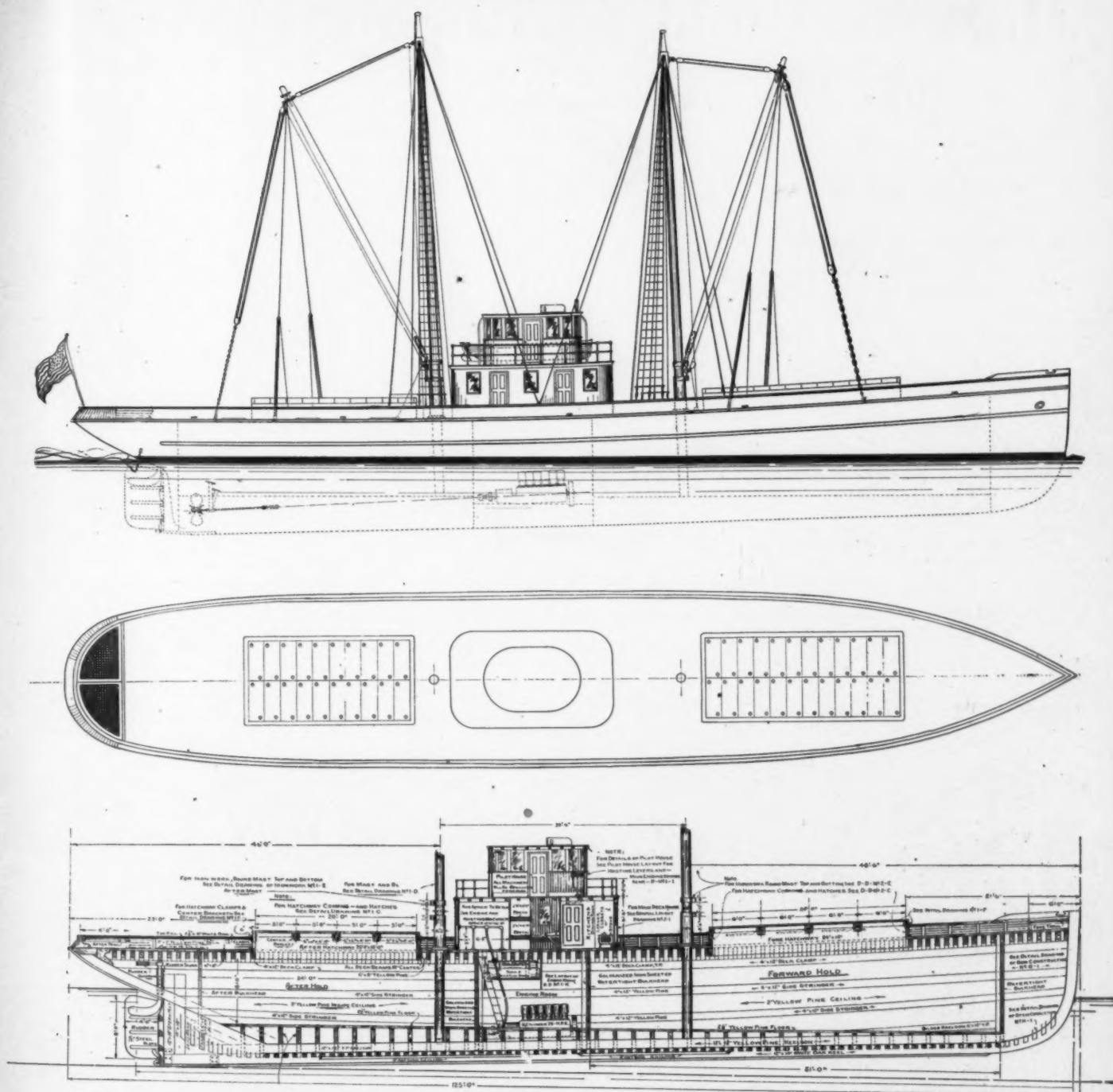
all, 125 ft.; beam, molded, 22 ft.; beam over

guard rail, 23 ft. 6 in.; depth, molded, 12 ft. 6 in.; length of forward hold, 51 ft.; length of after hold, 34 ft.; draft, loaded, forward, 7 ft.; draft, loaded, aft, 9 ft. 6 in.; thickness of planking, 3 inches. She has a carrying capacity of 240 tons.

The engine room is separated from the rest of the interior by heavy pine bulkheads sheeted with galvanized iron, and the fuel is car-

ried in two 100-gallon cylindrical tanks installed in basins in the engine room and arranged to drain overboard. The power plant will consist of two six cylinder, 75 h. p. engines, driving twin screws and producing a steady nine knot speed.

For hoisting purposes an 8-10 h. p. engine with hoisting drums, etc., is installed in the after part of the lower pilot house structure

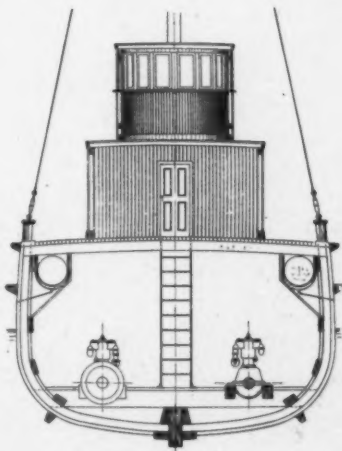


The Nielsen 125 foot cargo boat is an interesting example of the progress that is being made in the field of the commercial motor boat.

and will be used in conjunction with the cranes for loading and unloading the boat. All engine and reverse controls, together with the operating levers for hoists, are centered in the pilot house, thus putting entire mechanical equipment under the control of one man.

The keel of the new boat is to be of white oak 12 in. by 14 in. and the frame will be of the same material, 6 in. x 6 in. The keelson is to be of 12 in. by 12 in. yellow pine and oak, the recks will be of 3 in. by 3 in. yellow pine. The deck beams will be of 6 by 8 in. oak, the decks will be of 3 in. by 3 in. yellow pine and as previously stated, the planking will be 3 in. in thickness. Besides the engine room bulkheads there will be the usual forward and after bulkhead, so that there will be three water-tight compartments besides the forward and after holds.

Besides the keelson there will be the two 6 x 12 in. yellow pine bilge keelsons, 4 in. x 12 in. side stringers and two 4 in. by 4 in. deck clamps, and the whole interior will be sealed



Section amidships showing the position of motors and gasoline tanks.

with three-inch yellow pine, making an exceedingly strong and stiff construction. The 2 masts are 60 ft. in length, 16 in. in diameter at the deck and are stepped solidly in the keelson.

The boat has a flush deck with continuous bulwarks from bow to stern, and besides the hatches forward and aft the only structure is the deck house amidships upon the roof of which is the pilot house. The living quarters are in the deck house and consist of a galley and dining room besides berths for several men. The pilot house is raised clear of all possible obstructions and affords a view in all directions, making it an ideal place from which to handle the boat.

For hoisting purposes two heavy masts will be shipped, just forward and aft of the deck house. These will be 16 inches in diameter at the deck, will be stepped in the keelson, and equipped with heavy booms that swing over the hatches. In conjunction with the 8-10 h.p. engine referred to above they will be used in loading and unloading the boat.

How to Build an Engine Housing.

Protecting the Engine—The Problem of Interest to All Owners of Open Motor Boats.
Instructions and Drawings for the Construction of a Number of Simple Covers.

THE PRIZE CONTEST—Answers to the First Question in the February Issue.

Controls on Housing.

The Prize Winning Answer.

A COVER for the motor must also be a shield for the passengers. It must shed water and rain, and confine oil and noise. It must be easily and quickly removable so as to leave the motor accessible and yet a part of the cover should be permanent to carry spark and throttle controls, starting device and coils. In addition to these requirements the cover must be strong enough to carry the guests who prefer to sit anywhere but on the seats.

As the average motor, exclusive of the reverse gear, is not over 3½ feet long by 2½ feet wide, a box-cover with top but without bottom and one end can be made that will be of such weight that it may readily be lifted from the motor when repairs or adjustments are necessary.

In order to mount our starter, controls and coils, our cover must have a stationary part which will correspond to the dash-board of an automobile. In some installations it would be more convenient to have the "bulkhead" at the forward end of the motor, but as the reverse lever is at the rear end and the entire control of the boat should be in the hands of one person, we will consider the "dash" as placed aft of the motor, directly over the coupling between motor and reverse gear.

The "dash" should be made of the same ma-

terial as the sides, oak, cypress or mahogany, held together by ¾ x 2 inch oak cleats and braced to the floor by two ¾ x 1½ inch iron brackets. The dash is really the rear end of our cover and its cleats should make a frame which will just fit inside of the end of the removable part of the cover. A hook on each side of the cover dropping into eyes on the dash will hold everything rigid.

The sides and forward end of the cover can be made of ½ inch matched material or ½ in boards with ¾ x 2½ inch battens run around the edges to represent panels, or you can have the entire cover made with raised panels at a sash-and-door factory.

Cypress, oak or mahogany stained and varnished will do equally well, but the material must be thoroughly dry, preferably kiln dried, otherwise the heat of the motor will cause the joints to open up. Opposite the exhaust pipe, on the inside of the cover, fasten a thick sheet of asbestos, so as to leave an air-space at least ¼ inch wide between asbestos and cover to protect the wood and varnish.

The case should have a strong frame of ¾ x 2 inch oak, screwed together and a piece of the same size should connect the two upper rear corners of the sides. The lower rear corners can be held from spreading by short pieces of ¼ x 1 inch iron, bent with offset hooks and slipping over the engine-hatch coaming. (See sketch.) This coaming is of oak 1½ x 2½ inches high. It is screwed to the floor to make a frame, over which the

cover will just fit.

As most motor troubles are caused by the spark plugs or the timer, both located at the top of the motor, the top of the cover should be hinged. Do not hinge the top at its center line or to open at this place, as water will drop through the crack and cause trouble. The top should be made in one piece with a slight crown and hinged at one side. It should be fitted with a skylight quadrant to hold it up when required. Make the top of ¾ inch matched pine or cypress, over a strong frame and cover with canvas. Then you can stand on it without spoiling the finish and no amount of motor heat will hurt it.

To ventilate, bore a number of 1 inch diameter holes in the sides near their upper edges. Fit pieces of sheet-iron over these holes inside the case so that air can pass but oil cannot escape. Use no glass in the construction of the cover as it is sure to be broken, and do not make a motor cover of metal. Wood will deaden the noises much better.

Two hooks inside the cover, hooking into eyes on the coaming and a lock fitted to the top will keep out local investigators. The switch should be on the face of the dash-board, but if a simple switch located inside the cover is cut into the ground wire, it will be impossible to use the boat without the key to the top.

The reverse gear, if it projects above the floor, should be covered by a low box, having a slot in which the reverse lever can work

The Prize Contest in Questions and Answers

THE contest of late has taken on the dignity of a real, grown-up department—and not only in its size, for the quality of the answers is easily on a plane with the rest of the magazine. The drawings, too, have felt the boost, and whereas formerly it was necessary to re-draw not a few of the drawings submitted, this is now seldom required. This growth, however, is not confined to the quality and number of answers submitted, but is true of the length of many of them as well. The 500-word limit doesn't command the awe and reverence that it used to, and we must call attention that it is still there and request that contributors keep within it wherever possible. It is only by so doing that a representative number of answers can be printed as this department has about reached its limit in size. Bear in mind also that drawings for reproduction in line must be made with black ink, preferably India drawing ink. Colored inks do not photograph in their proper values and pencil is almost impossible for line reproduction.

THE answers printed this month should be of interest to every motor boatman. Protecting the motor in the open boat is the principal problem with this type of craft, and handling the ground tackle is a question of no less importance on the raised deck cruiser of moderate size. The use of charts is not as general among motor boatmen as it should be, and it is to awaken an interest in their possibilities that we chose it as one of the three.

THE QUESTIONS FOR THE JUNE CONTEST ARE THESE:

Give instructions and drawings for the construction of boarding steps suitable for use on a cruiser of moderate size.

Suggested by Donald B. Maynard, Worcester, Mass.

What suggestions can you give that would be helpful in outfitting a 30-foot cruiser to be used by four persons for a month's cruise?

Suggested by H. K. Maples, Richmond Hill, L. I.

Give whatever suggestions as to etiquette, rules of the road, signals, etc., that would be of value to the new motor boat owner.

Suggested by W. N. Washburn, Fort Wayne, Ind.

ANSWERS to these questions, addressed to the Editor of MOTOR BOATING, 381 Fourth Ave., New York, must be: (a) In our hands on or before April 25, (b) not over 500 words long, (c) written on one side of the paper only, (d) accompanied by the senders' names and addresses. (The name will be withheld and initials or a pseudonym used if this is desired). Questions for the next contest should reach us on or before the 25th of April.

THE PRIZES ARE:

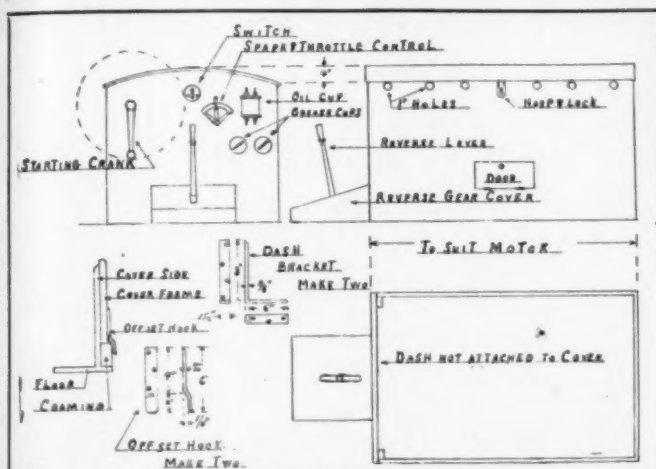
For each of the best answers to the questions above, any article advertised in MOTOR BOATING, of which the advertised price does not exceed \$25, or a credit of \$25 on any article advertised in MOTOR BOATING, which sells for more than that amount.

(There are three prizes, one for each question, and a contestant need send in an answer to but one, if he does not care to answer all.)

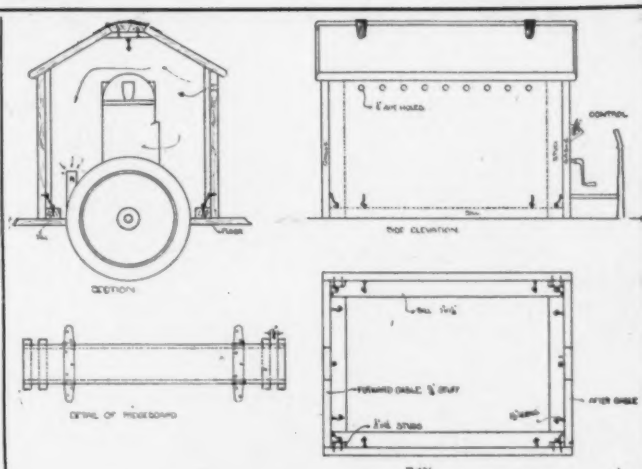
For each of the questions selected for use in the next contest, any article advertised in MOTOR BOATING, of which the advertised price does not exceed \$5, or a credit of \$5 on any article advertised in MOTOR BOATING, which sells for more than that amount.

For all non prize-winning answers published we will pay space rates.

When you send in your answer, state what you will take if you win the prize.



The cover described by H. B. Vahstedt with controls mounted on after end.



J. M. Macrae's housing is of the gable type.

back and forth. There should be a long brass plate with a hole closely fitting the reverse lever sliding on the under side of the top of the box, so that the slot is always closed and no oil or grease can be thrown out by the revolving drum.

If the motor is fitted with grease cups, mount these on the dashboard and pipe from these to the bearings with gas pipe, not smaller than $\frac{1}{4}$ inch pipe size. The grease will not readily flow through a smaller pipe. Do not use elbows, but bend the pipe in easy curves to where you want it. If there are oil cups on the motor, mount these on the dash also, fitting longer oil leads. Give these leads as much drop as possible all the way and put no short bends in them.

A small door may be cut in the side of the cover at the carbureter so that the gasoline may be shut off or the adjustment readily changed.

This cover is strong enough to carry a good load and with a cushion for the top will make a nice addition to the seating accommodations. With the arrangement of the control, starting device and lubricating system, and steering wheel if desired, on the dash, all of it is within reach of the operator of the boat.

H. B. VAHSTEDT, Racine, Wis.

A Collapsible House.

WITH a double opposed type of motor, it is possible to arrange the housing so that it may be used as a seat, but with the vertical type, the seat would be too high and uncomfortable. The accompanying drawing shows a design which can be readily taken apart and packed into a small space, also put together in a moment's notice.

The sills may be made of 1 inch by $1\frac{1}{2}$ inch pine, securely screwed to the floor around the motor, including the clutch, if desired. Two side pieces of $\frac{3}{4}$ inch pine or any other material, depending on the trimmings of the

boat, are fastened to the sill by means of two hooks. Two studs $\frac{1}{2}$ inch by $1\frac{1}{2}$ inch are fastened to each side piece, $\frac{3}{4}$ inch from the ends. The forward and after gables made of $\frac{3}{4}$ inch material are also fastened to the sill by two hooks and to the side pieces by hooks placed diagonally across.

The covers are fastened to the ridge board by means of skylight hinges and the ridge board is fastened to the forward and after gable by two hooks.

For ventilation a pipe, the end of which is above the water line, may be connected with an under water exhaust. This produces a suction which will keep the housing free from foul gases.

The control with steering gear, etc., may be placed on the after gable and this securely fastened to the sill.

J. M. MACRAE, Brockville, Ont.

No Wiring Exposed.

A SATISFACTORY housing for a motor in an open boat is made as shown in the sketch, which shows arrangement and construction quite plainly. No dimensions are given as they will vary with different size motors, but be sure to get it large enough for motor and reverse gear if one is used. The corner posts are $1\frac{1}{2}$ inch by $1\frac{1}{2}$ inch oak or hard pine, the sides are $\frac{1}{2}$ inch stock, nailed to the corner posts, grain running horizontally; $\frac{3}{4}$ inch by $2\frac{1}{2}$ inch stuff fastened with finishing nails around the edges and up the middle of the sides makes a neat panelled effect. A 6 inch hole cut in each panel gives ventilation, also access to mixture and oil, if located right.

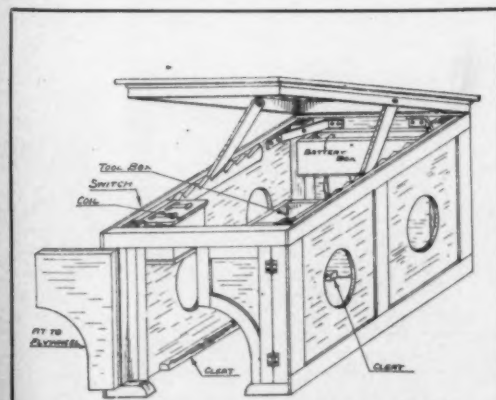
In front are two doors with panels made same as the sides, and cut to fit over the rim of the flywheel of the motor with $\frac{1}{2}$ inch clearance. These doors are hinged to swing apart. A header over the doors binds the front and sides. Fasten two short pieces at the bottom of the doors to keep them off the

floor of the boat. (See sketch.) The back is made same as the sides, notched to fit over the propeller shaft, if necessary; cut ventilation holes in each panel here also. Angle irons across the corners will add to the strength here. (See sketch.) The cover is made of $\frac{1}{2}$ inch stock with cleats across the inside fastened with brass screws, and $2\frac{1}{2}$ inch drop sides; these sides are $\frac{3}{4}$ inch thick, to make them even with the sides of the housing. Let the top overhang the drop sides about 1 inch and nail $\frac{3}{4}$ round mould in the corners on the outside. A slit is cut in the cover to allow reverse lever to project through. Cover is hinged to housing at the back. A support arm on each side pivoted to the drop, arranged as shown in the sketch, will hold the cover at any height desired when working around the motor. Across the back on the inside of the housing is a battery box wide enough to accommodate a single row of dry cells. If a storage battery is used a shelf with a ledge all around it will take care of it here nicely. In front, on the inside and in one corner, is the coil with a switch on the outside. In the other corner is a tool box. With this arrangement the wiring is all inside of the housing, none of it being exposed. Nail cleats to the floor of the boat against the inside edges of the housing; these prevent the housing from sliding around, and still allow it to be removed, if necessary. This housing allows motor to be started without opening any doors, takes care of reverse gear, batteries, coil, tools, etc. Also gives plenty of ventilation. It should be built of material to match the inside finish of the boat.

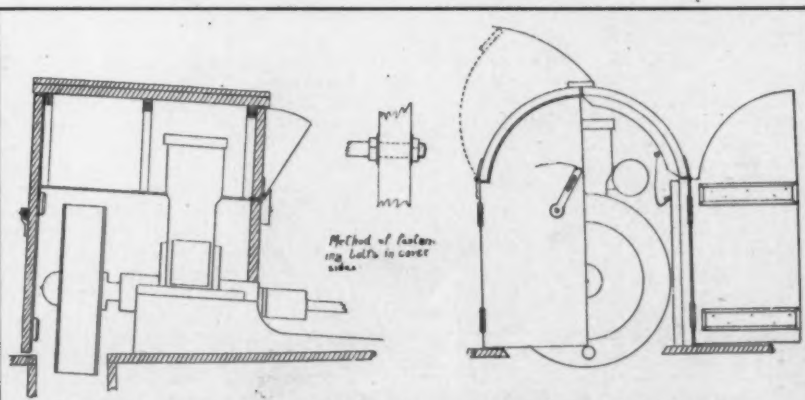
GEORGE SORESENSEN, Rockford, Ill.

A Neat Housing.

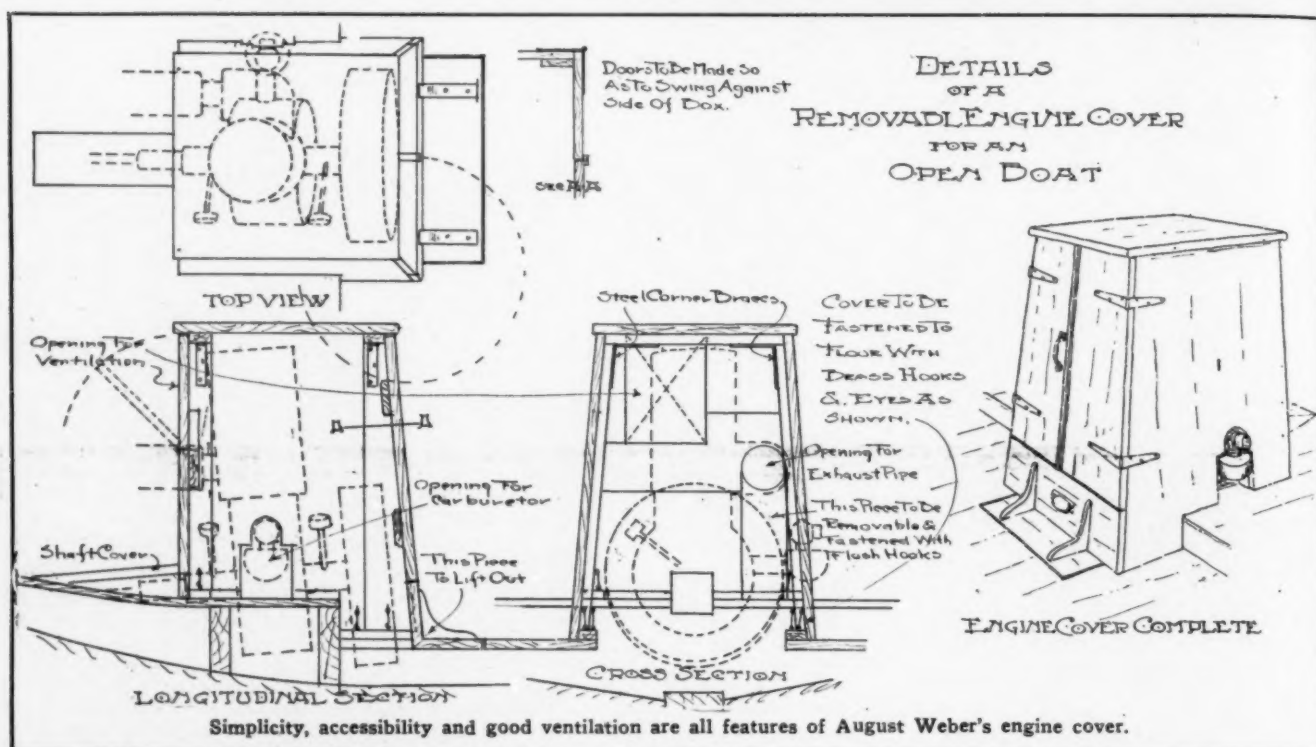
THE cover for an engine in an open boat should be designed with the idea of protecting the occupants from oil and danger of getting in the way of moving parts on the engine. Proper ventilation should be



The housing described by Geo. Sorensen.



The accessibility of F. H. Maloney's cover is a commendable feature



provided and the cover should be weather proof and at the same time leave the engine so that it can be started and looked after generally.

The cover shown in the drawing fulfills these conditions as the two front doors and top cover can be opened for starting, oiling and ordinary adjustment. While running the top and front doors can be kept closed unless an engine is not very well cooled, in which case the front doors can be opened somewhat. In case the front doors are closed the air can enter under the flywheel and also through the upper half of the back, which should be left open at an angle of about 60 degrees where it is held by turning the button, as shown in the drawing. A small door not shown in the drawing, which can be raised in slides, is placed front of the carburetor and the air intake on the carburetor led outside the housing so that no gasoline vapor can flow back and collect inside.

The frame of the cover is best made out of white oak, the carlins for the top being sawed out. The outside can be made of almost any kind of wood about $\frac{3}{4}$ inches thick. The top is made of narrow strips and the seams either calked and puttied or filled with marine glue.

The front doors are hinged so that they will swing through an arc of 180 degrees. The sides are held together with bolts, not shown in the large drawing. Two of these should be placed in the back and one in front over the top of the flywheel. The whole cover is simply set on the floor and hooked so that it can be easily removed in case any unusual repairs are necessary. Narrow strips should be nailed to the floors inside the box to keep it from moving sidewise.

No dimensions are given, as each engine will have to be accommodated. The cover may easily be changed to cover any number of cylinders.

F. H. MALONEY, New Haven, Conn.

Simple and Accessible.

A SIMPLE engine cover may be constructed as shown on the drawing accompanying. This cover with a few slight changes will meet the requirements of the average open motor boat. It is removable, so as to enable the operator to get at any part of the engine without much trouble. The removable piece below the doors should be high enough so as to allow the doors to swing back against the sides of the cover. The opening in the floor should be large enough to allow plenty of knuckle room when cranking the engine.

The small door aft can be used for ventilation and it allows the operator to feel the temperature of the engine without opening the forward doors.

The throttle and spark may be connected to the outside with a stiff piece of wire.

AUGUST WEBER, College Point, L. I.

Handling Ground Tackle.

What Is the Best Arrangement for Handling the Anchor and Cable on a Small Cruiser?
The Big Problem of a Raised Deck Boat Discussed by MoToR Boating Readers.

THE PRIZE CONTEST—Answers to the Second Question in the February Issue.

A Hinged Davit.

The Prize Winning Answer.

THE ground tackle of a thirty-foot boat should consist of two anchors, say a thirty-five and a fifty-pound one. While the smaller one will answer in most cases there are times when it will be necessary to use the large one and possibly both of them to ride out a storm. Either one of them is light enough for a man to haul bodily on deck, but the objection to this mode in handling lies in the fact that the sides of the boat must suffer each time it is raised. The accompanying sketch shows the construction of a small hinged davit, weighing in the neighborhood of 8 to 10 pounds, that will overcome this difficulty and at the same time occupy little or no space when not in use. Another feature in its favor is that it allows the person raising the anchor a better chance to

work than if leaning over the side, a dangerous task in a seaway.

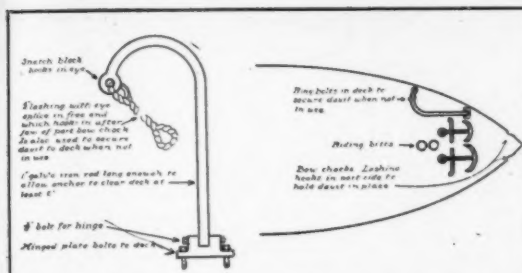
To hoist, release the lashing securing the davit to the deck and raise the davit in place, hooking the eye splice in the end of the lashing on the after jaw of the bow chock. Then hook a snatch block in the eye of the davit, slip the cable in the snatch block and haul away. After the anchor is up snub the cable to the riding bitts and it is in a position where it may receive a thorough washing before catting. This same process may be repeated in lowering if desired, and its use will prevent a great deal of grumbling among the fishermen about the way many throw their anchors overboard and frighten the fish away.

Oftentimes difficulty is experienced in breaking out an anchor after it has been imbedded on the bottom for some time or is caught on a stone or other obstruction. Experience tells

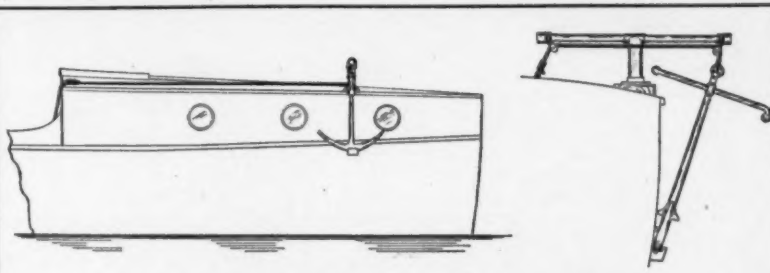
us that the best way to clear it is to shorten up and run in a circle which will usually free it. However, it is advisable when anchoring where the bottom is known to be rocky to fasten a tripping line to one of the flukes as a precaution, and should it become foul of anything it is easily cleared by hauling on the tripping line.

Lashed on deck is the only way to stow the anchors unless one desires to carry them forward each time they are put to use. A simple and secure method is to lash them to ring bolts bolted to the deck. In this way they are accessible for use in a moment's notice, are out of the way, and present a more shipshape appearance. Their location and means of securing will depend a great deal on the style of anchor used, and may be easily worked out to suit each individual requirement.

CHAS. McILROY, New York City.



The hinged-davit suggested by Charles McIlroy.



R. W. Goddard's davit made of gas pipe and fittings.

A. Unique Device.

THE inconvenience and danger of crawling over the cabin top to get forward, hauling on a heavy anchor with scarcely any foothold and that wet and slippery, led to the development of the following idea for handling the anchor: The davit is made of ordinary pipe and fittings. It consists of a short length of 2-inch pipe with a pipe railing flange at the bottom bolted to the deck and 2" x 1" x 1" tee at the top. Two pieces of inch pipe 18 inches long with caps on the ends are screwed into the tee. Two 1 1/4" single eye mast withes are fastened to these pipes close to the caps by drilling small holes through the withes and pipe, driving in short pieces of wire and heading over the ends. The anchor rope passes through two pulleys fastened to the withes and one bolted to the deck under the inner arm of the davit, to a heavy cleat near the cockpit. The anchor has a hole drilled in the bottom into which a short piece of 1/2" rod is driven. This rod protrudes about an inch and serves to hold the anchor in place when raised by fitting into a corresponding hole in a hardwood block bolted to the side. Strips of sheet copper protect the side from being marred by the flukes bumping against it.

To come to anchor the rope is hauled up short, lifting the anchor pin out of its socket so that the anchor swings free, when it is lowered away. When enough scope is out the rope is fastened to the deck cleat and the boat is secure. The davit acts as a check and prevents the rope from chaffing against the side of the boat, and because of its shape, the pulling stresses balance one another. To get under way the anchor is hauled up close to the davit and then with the boat hook, without leaving the cockpit, the bottom is swung in and the rope played out enough to

drop the anchor pin into its socket, when it is secure. For very rough weather, or if the anchor is not to be used for some time, it can be hove short, a rope's end passed around a fluke with the boat hook and the anchor hauled into the cockpit, folded up, and stowed in a locker. The rope can be coiled on deck or passed down to a convenient locker. The davit is then turned around so as to be fore and aft and not extend out over the side, a long and deep thread having been cut to fit the tee loosely for this purpose. This device is exceedingly handy when the anchor is in continual use as when on a cruise.

R. W. GODDARD, Worcester, Mass.

Trip Line Recommended.

WHEN lowering your anchor always wait until the boat has lost her headway and, if necessary, back her until she gathers sternway, then let go and pay out gradually on the line until the anchor holds. When anchoring in rocky places it is best to put a trip line onto the eye in the bottom of the anchor. The line should be a little longer than the depth of the water and the upper end can be buoyed with a small piece of wood or tied to the anchor line.

To get up the anchor, heave up short on the line until the boat is over it, and then if it has too firm a hold to break by hand, take a couple of turns around your cleat and go ahead slowly on the engine. This will usually break it out. Then haul up until the anchor is just below the surface and hold it there a few minutes to wash it off before bringing it on deck. The line should be left on deck to dry before stowing away in a locker or other closed place.

The best way of stowing the anchors on a cruiser of less than 30 feet is to have the

large one fitted with a screw shackle so that the line can be taken off and stowed in a locker or other convenient place and the anchor put away under the cockpit floor or on deck in chocks as shown.

The small anchor which is used most should be kept ready for use on the forward deck, with the line coiled up flat or led through a deckplate to the storage space in the bow.

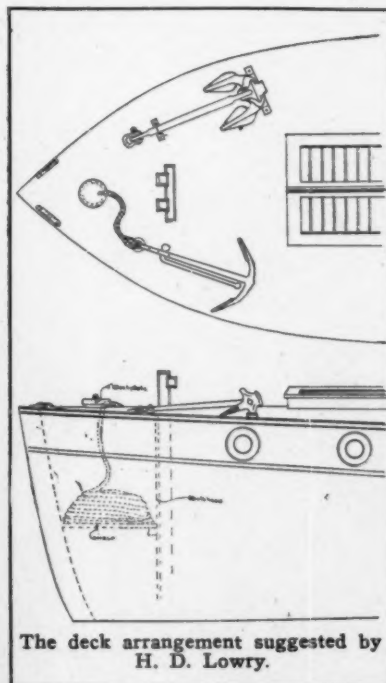
H. D. LOWRY, Richmond, Va.

Safety Considered.

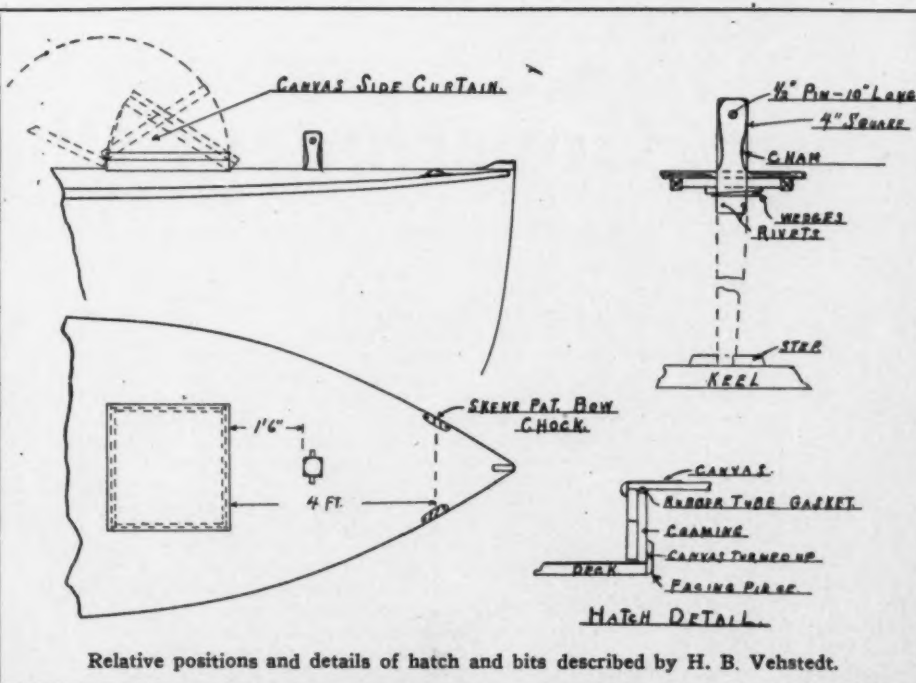
FOR handling ground tackle on small raised deck cruisers, the most important thing is a safe place from which to work. Such a boat cannot carry a rail which will be of any practical value, except as a toe hold, in preventing a man from going overboard. Therefore we must look to some other means to secure the necessary safety.

All small cruisers to be habitable should have some way of ventilating the cabin. If the double-hinged hatch shown in the plans is carefully made and pulled down tight on the rubber tube gasket with two hooks, it will be perfectly tight. Fitted with canvas side pieces, it may be propped open facing aft and no spray will get into the cabin, although there may be considerable sea running. In pleasant weather the hatch is propped open facing forward, and when handling ground tackle it is dropped back on deck, entirely out of the way.

The hatch, to serve our purpose best, should be about 18 inches back of the mooring bitts. There will probably be a transom under this location. By standing on the transom with the hatch thrown back on deck, a man will have the deck at about his waist-line and will be braced so that he can give all his attention to handling the anchor without any possibility of being pulled overboard.



The deck arrangement suggested by H. D. Lowry.



Relative positions and details of hatch and bits described by H. B. Vehstedt.

The hatch can easily be within reach of the chocks on a boat of this size so that the anchor can be brought right on deck and lashed or passed below without having the crew leave his position. If there is no transom where the hatch should be, a permanent or removable shelf can readily be fitted.

To raise the anchor on a boat of this size no special equipment such as a capstan is required. Even the storm anchor will not weigh over 60 or 70 pounds, and this weight can easily be handled the few times that this anchor is used during the season. The regular anchor of from 30 to 40 pounds is easily handled at all times.

What will be required, however, is a good stout oak mooring bitts, not less than 4 inches square by 9 inches above the deck, fitted with a half-inch pin, about 10 inches long, of bronze or galvanized iron. The post may be held by wedges under the deck or may go to a step on the keel, as shown by dotted lines. Chamfer the head of the post so that it is smaller near the deck and your hawser will not ride over the top. The pin should be put through the post at right-angles to the length of the boat. A pair of Skene patent chocks should be fitted near the stem, or ordinary bevel bow chocks will do.

For average use the Babbitt anchor is best. This anchor will stow on deck nicely and without adjustment, takes up less room than any other style of the same size, and is always ready for immediate use. There is also less danger of this anchor fouling the cable, regardless of how it may be put overboard. A short piece of 5-16 inch diameter manila rope should be made fast to the bitts. Two half hitches taken on the anchor stock with this line, holding the anchor close to the post, will prevent it from going overboard in a seaway. The anchor-cable should be coiled down on deck and held by two or three lanyards secured to heavy screw-eyes or eyebolts set in the deck.

This arrangement is safe, economical, and ship-shape, and there is no possibility of man, anchor or cable going overboard or getting adrift regardless of how the boat may be pitching or rolling. It does not require that the crew go over the cabin top to get to the anchor or mooring line.

H. B. VEHSTEDT, Racine, Wis.

Handled from Hatch.

THE real anchor is folded up and stowed beneath the floor of the cabin or cockpit. The chain is in the chain locker in the forward end of the cabin, with its free end brought up through chain pipes and the first link lashed to an eyebolt in the deck.

Be sure the shackle is in the ring of the anchor.

The forward deck is, of course, the handiest place to keep the anchor which is intended for ordinary use. A Manila rope is much easier to handle than chain and will do nicely for this anchor. It should be kept on deck with the anchor so as to be well aired and dried after being wet. Bolt a block of wood say 8 or 10 inches in diameter and 6 or 8 inches high to the forward deck and coil the rode line around this block. Put an eyebolt in the center of the block on top and one into the deck on either side of the coil of the anchor rope, and in line with the one on top of the block. Fasten a chain to one of the eyebolts in the deck, pass it through the eye on top of the block and with a padlock lock it to the eye on the other side of the coil. The block of wood will keep the rode line from going overboard in a seaway. The chain will hold it in place and when locked up it cannot be "borrowed" without being cut to pieces, which is not likely to happen.

The anchor should be one of the stockless variety as they are the easiest to handle and stow away.

The anchor is laid on the coil of the rode and lashed to the eyebolts which hold the chain. If the chain is passed through the ring of the anchor it cannot disappear while the boat is at her mooring. The advantage of this method is that the rode can be left on deck all the time and does not have to be stowed in the cabin possibly wet or damp when the boat is left at the mooring. If desired, a circular canvas cover can easily be fitted over the whole affair.

For a boat under 30 feet long the anchors will not be heavy enough to make a capstan or winch worth while. The difficulty is that the high, narrow deck of a cruiser is a ticklish place to work in rough weather. The simplest and safest method is to have a hatch in the forward deck about 15 inches square, just large enough to accommodate easily the body of a man.

There should be a seat or shelf in the cabin under the hatch to stand on which will bring the deck about at the waist.

The chocks and bitts must be within reach of the hatch and, if necessary, it should be placed off center so as to be able to reach over the side.

Standing in the hatch the anchor can be let go and made fast. When taking it in the line can be passed aft over the deck for a pull by the rest of the crew, if necessary, but the yachtsman does not have to go forward over a slippery deck and there is no danger of being washed overboard when both hands are needed for the anchor.

The hatch cover should be fastened on the

inside and should be water tight; a grating to replace the cover in warm weather will give extra ventilation.

WM. GEO. ALLEN, Portland, Me.

Davit and Deck Plate.

ON a cruiser under 30 feet in length, it is unusual and unnecessary to carry a windlass for getting up the anchor. Upon such a craft the regular service anchor would probably not weigh over 40 pounds, and a man can break out and raise an anchor of this weight by hand without undue exertion. It is when the anchor is about to be lifted clear of the water and taken in over the bow, "catted and fished" the sailors say, that the need of some appliance is felt for keeping the sharp-edged flakes from digging into the boat's planking.

A galvanized anchor davit to project out over the starboard bow, and fitted with a sheave through which is rove a stout rope into one end of which is spliced an anchor "fish hook" is a very useful piece of equipment. This davit may step into a galvanized deck plate with a squared socket made to fit the foot of the davit. Two of these sockets will be found convenient, one on either bow, thus enabling the davit to be used over either the starboard or the port bow as desired. The davit should be strong but not too large, and should overhang sufficiently to allow the anchor to come up well clear of the boat's bow. In operation the cable is belayed on the bitts when the anchor is at the surface, and the "fish hook" is slipped around the shank. A short pull on the line soon brings the "mud hook" up to the davit-end, where it can be easily reached with the hand and lifted in on deck. With its stock slipped through and laid alongside of the shank, the anchor may now be stowed on the forward deck upon wooden blocks screwed there for the purpose. There should be three blocks, two cut out for the edges of the flukes and one fitted to the ball on the bent end of the stock. A ring bolt should be screwed into the deck between these blocks and a lashing passed through it and round the stock and shank so that no amount of motion can disturb it.

The manila rope may be run below through a deck pipe into a cable bin having a grated bottom (for ventilation and drainage), or it may be dried out on deck, coiled and carried below and stowed away in a suitable locker. When cruising it is a good plan to leave the cable coiled on the forward deck and bent on the anchor ring ready for any emergency. Needless to say it should be securely lashed in place when there is a chance of green water coming over the bow.

ALLAN O. GOOLD, Portland, Me.

Government Charts.

Something About Them and Their Value to the Motor Boatman Who Cruises Along the Coast, With a Number of Practical Suggestions for Reading and Using Them.

PRIZE CONTEST—Answers to the Third Question in the February Issue.

Of Value to the Motor Boatman.

The Prize Winning Answer.

CHARTS are maps of seas, bays, rivers, harbors, etc., in fact of all the known waters of the globe which are likely to be used by vessels, for the use of masters and navigators in guiding their craft from port to port. They are printed just the reverse to maps of the land, as the portions of the land shown are blank while the depths of the water are shown either in fathoms or feet. The difference in these markings is easily distinguished by the shading or dotting of the shoal sections, the soundings of which are given in feet, while the figures in the plain surface denote fathoms (one fathom

equals six feet). They also show the meridians of longitude, parallels of latitude, coast line, all shoals, lighthouses, lightships, buoys, and all other items that will facilitate their use to the mariner. The Government spends thousands of dollars each year to perfect these maps, which are accurate beyond realization and can be purchased for a very small sum at any hydrographic office in the United States.

They are indispensable to any one cruising in any waters, for without them navigation would be mere guesswork, possible only in clear weather and utterly impossible when landmarks were shut out by fog or snow. A glimpse into any pilot house or chart room will soon convince the most sceptical of their value to the sailor.

To motor boat men, they may not be so

important, as they, as a rule, are not pressed for time and can usually afford to lay over till the weather clears; still the satisfaction and confidence of the man who can lay out his course and cruise over it in the thickest of weather more than repays him for the time spent in mastering this simple art.

Securing a chart of the section to be covered, a pair of dividers, and a parallel ruler—two rulers so fastened together that they may be moved any distance apart and still remain parallel—comprise the necessary equipment. Place the ruler at the boat's present position and lay off as straight a course to the destination as possible, avoiding all reefs, shoals, etc. Should it be impossible to make a direct course to the desired point, various courses will have to be made to attain this object. Lay the ruler to the nearest

point that will clear the obstruction, being careful to make this point far enough beyond the obstacle to enable the boat to swing clear when changing her course. This will have to be repeated should more than one obstruction be between you and your destination until all are passed. As each leg of the proposed route is laid out mark lightly with a pencil, then slide the ruler over to the nearest compass inscribed on the chart; note the course and mark in on the line between the two points. Then with the dividers lay one leg on the point of departure and the other at the exact end of this course; measure the distance on the margin of the chart which is laid off in miles and note same immediately after the compass course, for instance, N. N. W. 15 miles, repeating this in every instance where the course has to be changed until the destination has been reached. This will be the magnetic course to be steered. To arrive at the true course it is necessary to obtain the exact variation of the compass used. Several simple and reliable methods of adjusting and securing the variations of a compass have been published in this magazine lately which should enable anyone following the directions given to acquire the true reading of his compass.

After securing the variation it must be added or subtracted to the compass course to obtain the true one.

Tides, currents and winds have a strong influence in obtaining this true course, as for instance during ebb tide the course would be considerably different from that followed during flood. If the old adage, "In fair weather prepare for foul," is followed and the course carefully checked off when the weather is clear, notes made of the drift under different conditions, time taken in covering courses and distances, and marked on the chart, they will prove of great service on small boats, especially where it is impracticable to carry a log or go deep enough into navigation to be able to figure out the effect of the many obstacles that confront the navigator.

E. A. CRAWFORD, Newark, N. J.

A Good Suggestion.

THERE is a certain commendable pleasure in playing navigator, in practicing fine points connected with the use of the chart, compass, and lead line. Those who have negotiated difficult channels or entered obscure bays to find safe anchorage on a dark night when hundreds of miles from home in strange waters, or have made long fog runs successfully, understand the fascination of figuring out tide and wind effects, and of accurately following plotted courses.

But the great majority of motor boatmen seem to feel that this is too much like work and interferes with what should be the care-free life of a cruise. It is for such that the following suggestion is made:

Take the number of miles which your boat makes in an hour and mark off this distance on the edge of a piece of paper from the scale of a chart. By carefully folding the paper you can divide this distance into four equal parts. Each of these, then, represents the distance you will cover on the chart in fifteen minutes. For example, your boat makes eight and one-half statute miles in an hour. Mark on the paper from the statute mile scale the distance, which represents eight and one-half miles on the chart, and divide this distance into four equal parts. Of course, the scale thus made may be lengthened to represent two, three or more hours' run if you wish. Now, put the O mark on a known part on the chart from which you start and mark on this spot on the chart with a soft pencil the time you start; for instance, 9 A. M., then with this paper scale you may find out what time you will arrive at another known spot, such as a bay, a lighthouse, or a promontory. You expect then to pass a certain point at 10:15. When it is 10:15 note on the chart as near as possible just where you are. Perhaps if the tide and wind are against you it

will take another fifteen or thirty minutes to reach it. Then you can make another paper scale which will show the actual time you are making. Or, if conditions are favoring you, this given spot may be reached at 10 o'clock. In this case as well you can make a scale which will show your actual speed.

With these little scales and frequent checking you can "log off" your distances quite accurately, so that you may always know just "where you are at" and can tell just what time you will "get there."

Another thing of use to the amateur photographer is to note on the chart with soft pencil the spots you "snapped," "Photo. 1," "Photo. 2," etc.; it will give the best kind of record of what these pictures are after you have developed them.

There is nothing technical about this, no brain fatigue goes with it, but it gives a whole lot of satisfaction. Try it.

E. W. M., New York City.

River Charts and Maps.

THE Mississippi River Commission issues both charts and maps of the Mississippi. On a first voyage down the Mississippi they place a motor boatman practically on the same footing as old river travelers, and my own experience was that I could travel night or day better than the average house-boat river man. I preferred the inch-to-the-mile maps to the charts, running by the river lights. The charts showing water depths cannot be depended on since the river channel is constantly changing. A latest copy of the "List of River Post Lights on Western Rivers (Fourteenth Lighthouse District, Cincinnati, O.), and the inch-to-the-mile maps are sufficient for the river tripper. The charts, however, are interesting and valuable for "reading" river conditions, and one should have a set of both mounted in atlas form between stout covers. River pilots use the maps.

The Mississippi is most astonishingly crooked. Its sand-bars and mud-bars travel steadily down stream. Above water the wind drifts the sands, and in places, as at Memphis, the soft mud flows against the reverse current of large eddies, owing to gravitation. The motor boatman reads from the map that the water is deep where the river is narrow, that the black line indicates where the channel runs through the maze of sand-bars, tow-heads and islands in reaches and crossings.

The map is, perhaps, of greater value in picking places to moor or anchor. Here the compass is of service—never land where the south or west wind has a clear sweep. A dozen house-boats are wrecked at such places as Cairo and Helena eddy when a gay old wind comes bouncing across the Bottoms. The maps show the chutes in which one may find safe harbor for the night—but in low water chutes are likely to be mere drifting sands. In high water, the levee bounds the river flood, and maps show where one may find the lee of a partly submerged wilderness.

Without the map, the tripper would frequently be at loss to know his position—in what bend or reach, opposite what town or bluff, he traveled. With the maps, there is little or no question on this score.

The compass is needed at night and in fogs, if one is so rash or venturesome as to drive out at such times. I did this in Lake Providence Reach—one of the worst on the river—on a foggy night. I knew the starting point and the hoped-for destination. The rate of river flow was guessable at about five miles an hour. Snags fit to tear our bottom out shot past, but the compass showed when we made the river bend, and we landed in a comfortable little eddy practically at the point we desired.

There is now always more than five feet of water below Cairo and with the post lights, maps, and latest news regarding river stage and shifting channel (the great low water menace), the Mississippi is easily navigated.

RAYMOND S. SPEARS, Little Falls, N. Y.

For Strange Waters.

AS we all know a chart is a representation upon a plane surface, in accordance with a definite system of projection, of a stretch of navigable water. There are three principal systems of projection in use; the Mercator, the Polyconic and the Gnomonic. An abbreviated definition of these from the American Practical Navigator, by Bowditch, is as follows:

"The Mercator is the result of the development on a plane surface of a cylinder which is tangent to the earth at the equator, and upon which the various points of the earth's surface have been projected."

"The Polyconic is based upon the development of the earth's surface on a series of cones, a different one for each parallel of latitude, and each one having the parallel for its base and its vertex in the point where a tangent to the earth at that latitude intersects the earth's axis."

"The Gnomonic is based upon a system in which the plane of projection is tangent to the earth at some given point, the eye of the spectator is situated at the center of the sphere, where being at once in the plane of every great circle, it will see all such circles projected as straight lines."

The Mercator is the system in most general use and the charts used in ordinary navigation are developed under this system.

When the motor boatman starts on a cruise in unfamiliar waters a reliable chart is an absolute necessity. It gives him the outline of the land together with the most prominent features of the same, the position of life-saving stations, lighthouses, lightships, buoys, beacons, and all other aids to navigation, the depth of the water, the direction and speed of the currents, all obstructions, the character of the bottom, good anchorages, etc.

The charts are easy to read as all symbols, abbreviations, etc., used are explained on some part of the chart itself, where they may be readily referred to when one is laying out the run for the next day. The depth of water is marked plainly, the figures in the shaded parts being read in feet and the others in fathoms. The depth given is mean low tide.

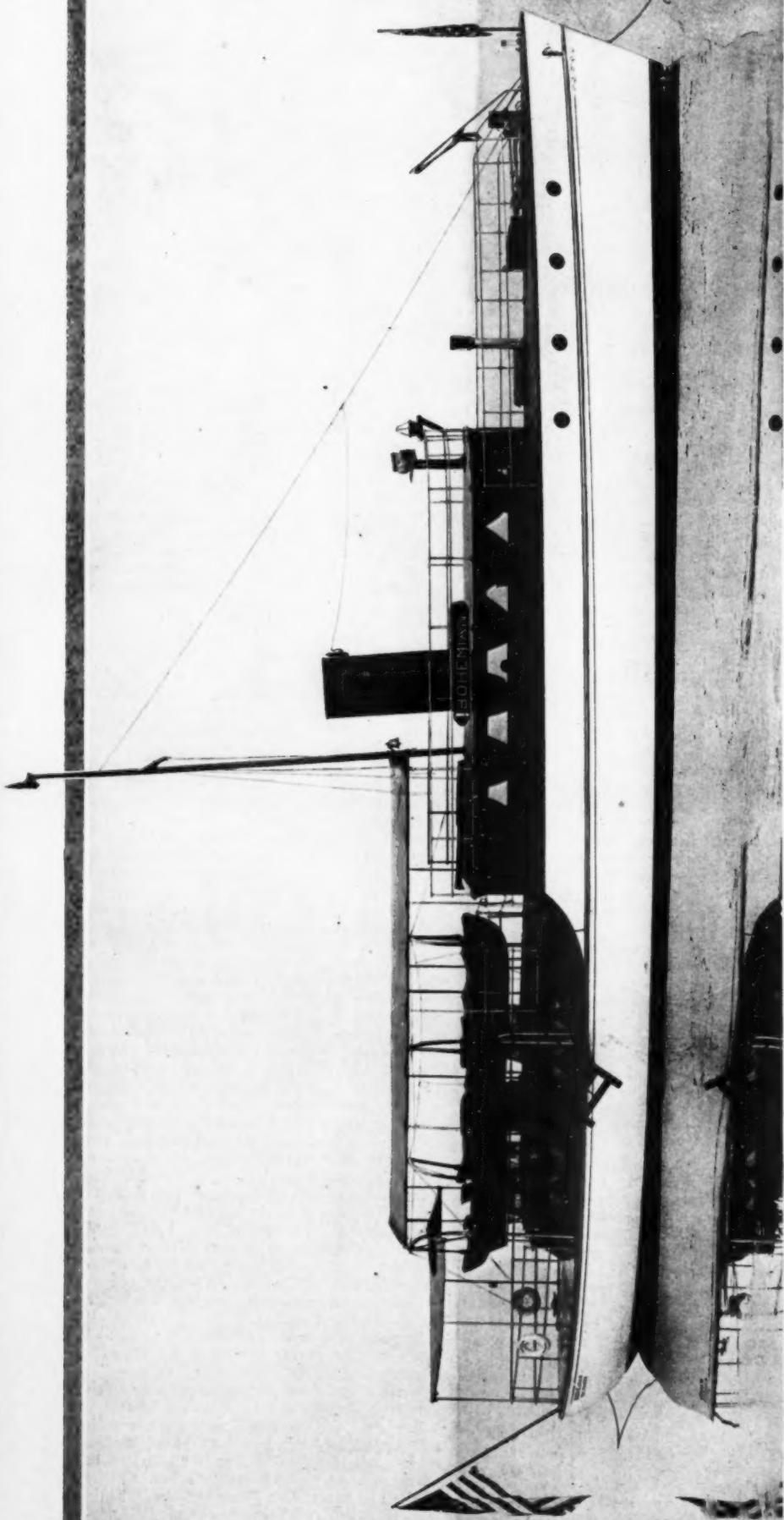
A compass rose appears frequently for convenience in getting the course, which is done either with a course protractor or parallel rule. Perhaps the simpler of the two ways is the parallel rule. This is laid upon the chart with one edge touching both the point of departure and the destination, and is then worked carefully over till it passes through the center of a compass rose.

A course protractor is a semi-circumference, preferably of transparent celluloid, having the degrees marked upon it. From a hole in the exact center of the diameter a strong linen thread is fastened so that it may be stretched taut, giving a straight line through any two given points. It is used by placing the diameter so that it will coincide with any one of the meridians of longitude on the chart and then moved along this meridian until the thread passes in a straight line through the points of departure and destination. The direction thus found will be the true course in degrees and must be changed to the magnetic course and usually to points for use with the small cruiser's compass. On some charts (notably Eldridge's), the principal courses between ports are given, but never on a Government chart.

In using a course protractor or a parallel rule one must *always* remember that the protractor gives the *true* course and the parallel rule the *magnetic* course, otherwise the navigator will find himself in continual trouble.

For use in conjunction with the charts it will be advisable to get a "List of Lights, Buoys and Daymarks" for the district in which the cruising is to be done, and a "List of the Lights and Fog Signals of the Atlantic and Gulf Coasts." These books may be procured at the local custom-house and they give a detailed description of the lights, etc.

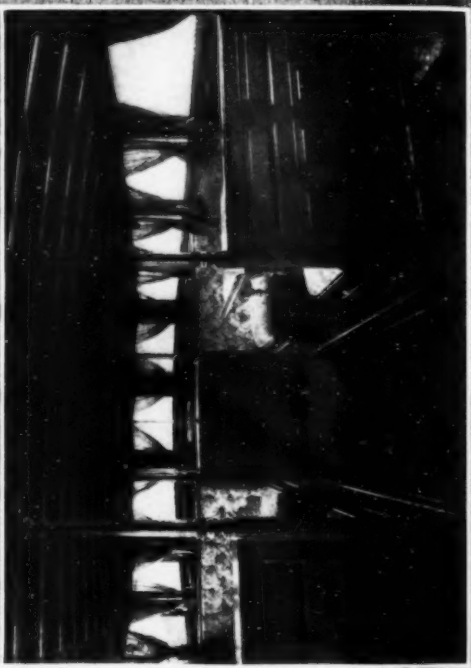
F. M. COMEE, Cambridge, Mass.

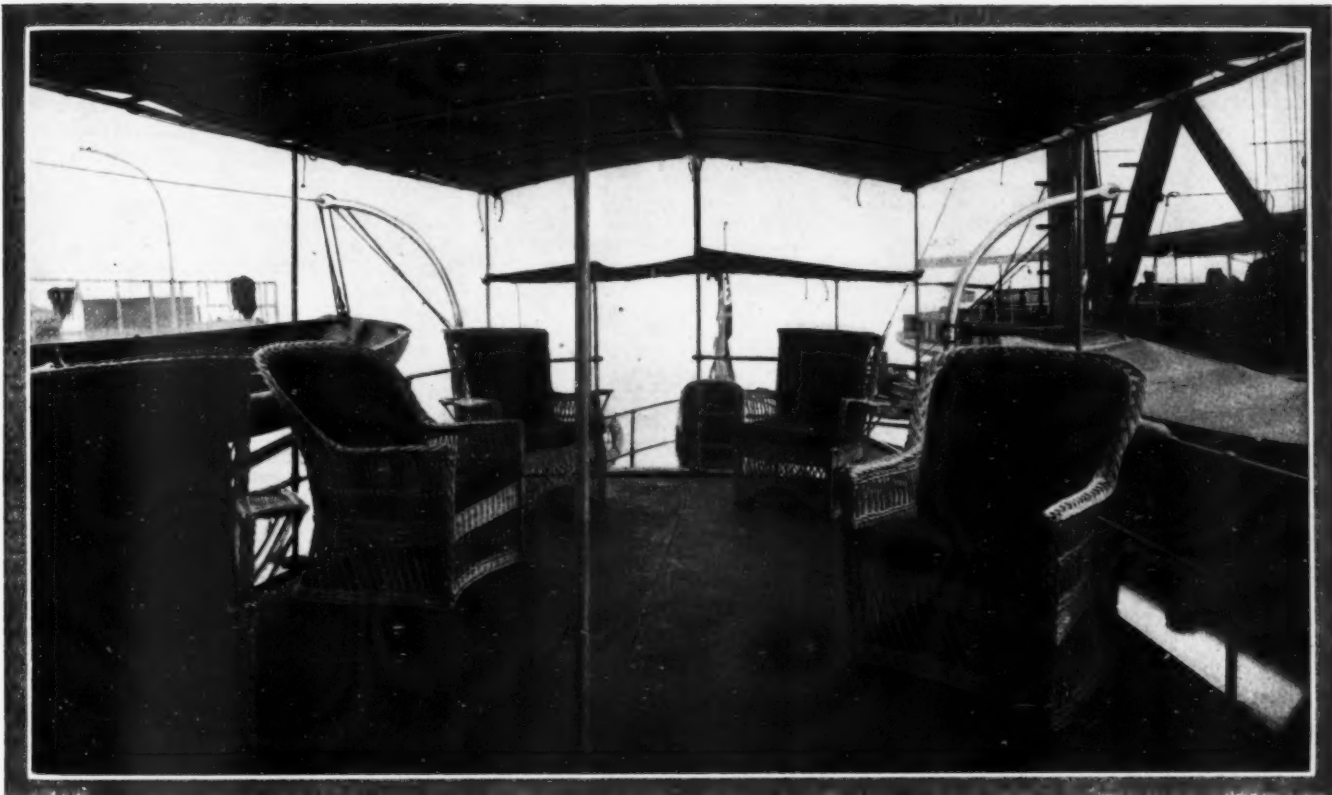


The low, midships deckhouse is Bohemian's most striking feature.

Bohemian--An Original 70-Footer.

| | |
|--|---|
| Length over all...70 ft. | Bore, 6 in.; Stroke, 8 in. |
| Beam.....14 ft. | Cruising speed, 12 miles per hour. |
| Draft.....3 ft. 6 in. | Gasoline capacity, 450 gallons in copper tank set in concrete |
| Framing.....white oak | Electric Lighting plant, 2 K.W. Standard with air compressor and bilge pump |
| Planking...Georgia pine | |
| Finish, exterior, mahogany | |
| Finish, interior, mahogany | |
| Motive power, one 50 h. p. 6 cyl. Standard motor | |





By utilizing the roofs of the cabin trunk and deck house, Bohemian has exceptionally large available deck space.

Bohemian-An Original 70-Footer

THE 70-foot cruising power yacht, Bohemian, was designed by Capt. L. J. Nilson, and built by the Nilson Yacht Building Co., of Baltimore, Md., for Mr. Walter W. Keith, of Chicago.

In looking over the illustrations, it will be noticed that the yacht possesses several novel features, which give her more available space for living quarters than the ordinary seventy-footers: for example, there has not been any space taken up for the engine room, as this compartment is located under the saloon and has plenty of room for storage batteries, electric light generator, switchboard, air-tanks, etc. In the after end and partitioned off from it, there is a large storage space for trunks and provisions, and on each side is a large water tank of 350 gallons capacity.

The gallery is forward of the engine room and saloon, and it has all modern improve-

ments, a large shipmate stove with hot water boiler attachment to supply hot water, not only to the kitchen, but to the bathroom as well; range and dresser are on the port side, and on the starboard side is a large icebox with lockers and shelves abaft. A large skylight over the galley and two large air-ports on each side, besides two deck ventilators, give plenty of ventilation. Under the galley floor is plenty of space for coal and wood. The galley is partitioned off from the forecabin, which is just forward of it, and a door in two-halves connects the two. In the forecabin there are accommodations for four men.

The owner's quarters consists of saloon, two staterooms, one bathroom and a toilet room, but the number of persons that can be accommodated with sleeping quarters is surprising, as the saloon is arranged with athwart-ship seats on the order of the pullman car type.

These seats face each other, and a table is placed between them, one end of which hooks into the partition, while the other end has folding legs so that it can be folded up and placed in a special locker when not in use for meals. The after part of the saloon has an extension sofa on each side, which make up into comfortable sleeping quarters.

From the saloon there is a passage leading aft to the owner's stateroom, which is full width of the yacht. Forward and on the starboard side is the bathroom; and forward of this, is the guest stateroom. Across the passage on the port side is an extra toilet room. Both the bathrooms and this toilet room have tiled floors.

Abaft the owner's staterooms is the compartment for the gasoline tank, which holds 450 gallons. This tank is made of heavy copper and is installed with 3 inches of concrete all around it.



All the living quarters are lighted and ventilated by drop-sash windows. Note the unique arrangement of the deck-house interior on opposite page.

Annual Meeting of the A. P. B. A.

President Koerner Tells of the Association's Growth and Suggests a New Cup for the Great Lakes.
An Exposition of the New Rules by Henry J. Gielow, the Official Measurer of the Association.

THE annual meeting of the American Power Boat Association, held recently in New York City, was of more than casual interest to motor boatmen throughout the country. Sixty-eight clubs were represented by delegates and forty-three by proxies and a number of other men prominent in the sport from the various motor boating centers were present, among whom, as a special guest, was President Osborn, of the Western Power Boat Association. In the election of officers, President H. T. Koerner, Secretary Morris M. Whitaker, Treasurer J. Norris Oliphant and Measurer Henry J. Gielow were re-elected unanimously for the coming year.

Of particular interest were the addresses of President H. T. Koerner and the annual report of Henry J. Gielow, measurer of the association and formulator of the rating rules of that body. Mr. Koerner's report in part was as follows:

"During the past year the American Power Boat Association has made remarkable progress. When the present administration began its work, there were enrolled in the association, 68 clubs with an estimated membership of about 11,000 individuals. Some of the clubs were of doubtful status. At the present time there are 114 clubs in good standing and a registered individual membership of over 25,000. This gratifying result has not been accomplished without hard and persistent work on the part of your officers. The work of the association has not been confined, however, to the enlargement of its club list alone, but, during the year just ended, at various meetings, much important, far-reaching and progressive work has been instituted, which, when fully carried into active operation, will materially advance the welfare and direction of the motor boat interests involved.

"The general adoption of the standard or limited classes of boats for racing, urged by the association, alone should develop a great field of building and create a distinct class of craft, that in a few years will entirely set aside the detrimental conditions that have afflicted the healthy and steady growth of moderate speed boats intended both for safe runabouts and for racing.

"Your president has been requested by the newly organized and important Buffalo section of the A. P. B. A. to secure for the Great Lakes, the proposed Silver Perpetual Challenge Cup. This silver cup, with the Gold cup and the Bronze cup, will complete the special trophies authorized by our association. It will be necessary that the clubs directly interested shall subscribe the amount necessary to procure the trophy. It is hoped that upon favorable actions by your body a committee will be appointed for this specific purpose, which shall have charge of the matter, including the formulating of the deed of gift and the general conditions governing the annual races.

"At the special meeting held at the Thousand Island Yacht Club, in August, the conditions that govern the Gold Cup Races were somewhat modified to insure an increased list of entries for this annual trial for very high speed boats. It is hoped that the officers for the coming year will be authorized at this meeting to amplify the conditions still more, and endeavor to make this important race a truly international meeting. This desirable change would be the initial step in securing for the American Power Boat Association the representation in the United States of all international racing events. As the national body, which in fact it is to-day, it is the proper and representative association to conduct through one or more of its constituent clubs all events of an international character."

Mr. Gielow's report covered much the same

ground as his interview on the new rules printed in the January issue. He touched upon the necessity of restricted classes to keep the sport of racing within the reach of the man of limited means, citing the newly established classes as follows:

- Class X. L.—Maximum length, 32 ft.
Minimum weight, 2,900 lbs.
Maximum cyl. vol., 570 cu. in.
- Class Y. L.—Maximum length, 26 ft.
Minimum weight, 2,100 lbs.
Maximum cyl. vol., 385 cu. in.
- Class Z. L.—Maximum length, 21 ft.
Minimum weight, 1,600 lbs.
Maximum cyl. vol., 255 cu. in.

"The other important subject," said Mr. Gielow, "is making the weighing of power boats mandatory. The midship section factor in the rating formula being then derived directly from the displacement. The object of this provision was primarily to eliminate several possible and likely sources of error by replacing several measurements and the calculations arising out of them, by one very simple and definite measurement, the weight; and, furthermore, to discourage freak designs intended to cheat the measurements and resultant ratings therefrom.

"In order, however, to get the true perspective on this change, it is necessary to go back a little. When in 1903 the formula, speed rating equals the cube root of the load water line multiplied by the horse-power and divided by the area of the midship section was first proposed by myself and adopted by the association, boats were driven at speeds normal to their form. The automobile racing boat had not yet put in an appearance and all that was contemplated in providing measurement rules was to enable yachtsmen who had cruising boats to get together in different classes and indulge in the friendly sport of racing 'catch as catch can.' Now, when a boat has the run normal to its speed, the latter not being excessive for its displacement, it is found that the fore and aft position of the midship section varies from about 52 to 58 per cent. of the load water line length measured from the bow, or a mean of 55 per cent. Taking into consideration further that a variation of 2 per cent. in either direction would make no appreciable difference one way or the other, it was decided to take 55 per cent. of the load water line measured from the forward end, as the midship section of a power boat.

"During the season of 1905 it began to be realized that in the fast automobile racing boats which were being built in larger and larger numbers, the position of the midship section tended to be considerably farther forward than in the average cruiser. This was a necessary consequence of the powerful character of the engines with which they were provided, for while brute force will drive the bows of a boat into the water ahead of it, the convergence of the stream line flow under the stern depends on the action of gravitation, and this means in practice that a fast boat requires a longer run. In view of the fact that these boats would be out of the water from time to time, it was thought best to take the actual midship section, wherever found, the balance of the formula remaining unchanged."

Mr. Gielow further explained that since the end of the 1906 season, at the suggestion of many yachtsmen that boats be weighed, the matter has been thoroughly investigated justifying the incorporation of this clause in the new rules.

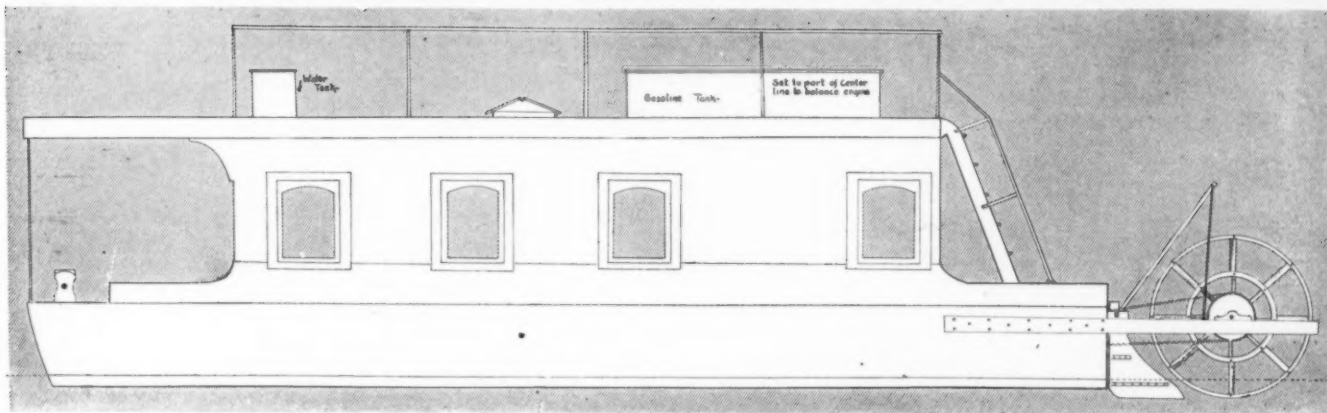
"The principle objection to ascertaining the midship section where found is that unless the services of an engineer or professional naval architect are requisitioned considerable error is possible. To find the weight of a

boat on the other hand, is a very simple matter. All that is required is a couple of slings placed under the bow and stern, a couple of multiple blocks and tackle to raise her and a couple of beam scales of any of the standard types from which the two ends of the boat can be conveniently suspended. Then the sum of the two scale readings is the weight required, for obviously it makes no difference how the total weight of the boat is divided up between its two supports. To obtain the area of the midship section, the weight of the boat in pounds is multiplied by the constant .0284 for sea water and .0291 for fresh water and divided by the load water line length in feet.

"So far as the extent of the probable error which is liable to exist in this as in any other method of measurement based on an approximation, is concerned, it is certainly not greater and is probably much less than the error involved in assuming that the mean effective pressure in the cylinder of a marine engine is 66 lbs. or that the normal piston speed per minute may be taken at 1,000 ft., both of which assumptions are implicitly involved in taking the horsepower for rating purposes as one-half the piston area multiplied by the number of cylinders. Moreover, as the midship area, as it appears in the rating formula, represents both the wetted surface and the displacement there is a certain propriety in calculating it directly from the latter of these two qualities, and that one the principle of the co-ordinate or designating factors by which boats are classified in practice.

"I should like to correct a wrong impression," said Mr. Gielow, "relative to the functions of a measurement rule, which is unfortunately only too widely spread. A common idea seems to be that if any number of boats are measured and rated under a rule their correct times should all be exactly the same when the race is finished. Now, as a matter of fact, this is exactly what the rule will not do, for it assumes an ideal or perfect boat and as such a craft has not yet been produced, it is clear that the boat with the poorest model, motor, propeller, etc., must inevitably make the poorest showing. We are all striving for something higher and better and any rule that places inferiority on the same level with superiority is wrong in principle and practice. To show how accurate our rating rule is for the purpose for which it was constructed it may be mentioned that in one of the Gold Cup Races on the Saint Lawrence, five out of the seven starters on corrected time finished the 30-mile course within two minutes of each other.

"Another way of looking at the matter is to remember how a rating rule is put together in the first instance. The fundamental assumption which underlies all results as they arise in practice is that the rate of output of a marine motor is proportional at all ordinary speeds to the cube of the knots. Now, as a matter of fact, every vessel whether of the moderate or high power type instead of having a resistance curve which is a curve of cubes or a true line has a curve with alternately slightly higher and slightly lower points. But if a number of curves are drawn over each other representing boats, say from 15 to 100 ft. in length advancing step by step, say of five ft., there will be a series of wavy curves through which a mean curve may be drawn that will fairly represent the average and this curve will be practically a curve of cubes. In assigning to each boat a constant by which it can be referred to this curve of cubes, and this is all that rating amounts to, the implicit standard is the ideal boat of which we have spoken and of which the resistance curve should be the mean of the actual resistance curves as actually plotted."



For simplicity and shallow draft the stern wheel method of propulsion has been used.

How to Build a House Boat.

One of a Type of Craft That, in Many Sections, is Taking the Place of the Summer Cottage.
A Shoal Draft Motor Driven Boat that is Extremely Simple in Construction.

By Gerald T. White.

THE house boat shown in the accompanying plans and description was especially designed so that it might be easily and cheaply built by an amateur. Its roominess is its chief feature, and I don't believe that it is possible to obtain any more room in a boat of the same length and beam. The second feature of the design is that the boat can be built very easily by an inexperienced man, for a sum in the neighborhood of \$500. A two cylinder engine developing about 8 h.p. will propel the boat at a speed that ought to satisfy the majority of owners. Of course the boat won't compare with "Dixie" in this respect, but she will be a source of much more pleasure, as a small family can live abroad her most of the year if desired.

The stern wheel method of propulsion was decided on after much thought as the most satisfactory method for shoal water craft. A chain drive is used with two paddles, as it is the easiest to construct and as it is the only satisfactory, inexpensive system, that can be put on a boat of the size we are considering.

As the beam is 10 feet, it will be rather hard to find a place indoors that has a door big enough to take the finished craft out, but if you happen to have a big barn, it should prove an excellent place to build the boat in. If the job must be done in the open, if possible build a temporary shed over the space, but if the boat is covered with canvas after you finish working with it each time, it will be sufficiently protected.

After you have found and fitted up your working place, get some rough stuff about 1 inch or 1½ inches thick, spruce is very good, and get out the molds as shown in the plans. Be sure to make these the exact measurements as given or else the boat will be all out of shape. Be sure also to fasten the molds together very firmly or else the strain of the sides when they are being bent on will pull them apart. After you have the molds out you can get your stem, stem-knee, stern and stern-knee ready. The sizes of these parts are all shown in the table, and the shapes are shown in the drawings.

Now you are ready to set the frame up, but you must have some level, smooth surface to fasten the molds to. The best way to do this is to obtain a couple of long boards that will be a little more than 26 feet long and fasten them together, being sure that the edges are perfectly straight. Then set the keel mold, as this board is called up on one edge, and securely fasten it so that it is about a foot high. Sight along the upper edge again to be sure that the board is straight, and then set the stem, stern and molds up on the

board and nail them on. Be sure to leave the heads of the nails out a little as these fastenings are only temporary and must be pulled out after the sides of the boat have been fastened on. Remember to put the stem on upside down as the boat will be built bottom up.

In setting up the molds be positive that they are at right angles with the keel mold, and that they are also set so that the center lines on both the cross piece and the bottom are perpendicular to the center line on the keel mold. The best way to do this is to drop a plumb bob down from the center line of the cross piece, and see if it drops exactly on the center of the keel mold, if not the molds will have to be reset.

If all this has been done properly you are now ready to bend the side planks on. The first plank to go on is the lower one, this plank should be about 28 feet long and about a foot wide and should be smoothed off on both sides and planed with a slight bevel on the edges so that the caulking cotton can be driven in when the boat is planked. If it is not possible to obtain these planks in one length, you can make them in two pieces and where they are joined you can screw a wide block of oak on the inside, but be sure that you stagger the butts, that is, don't have all the planks the same length so that the butts all come in line for this would weaken the hull considerably.

Saw off the end of the plank where it will fit into the rabbet on the stem and while some one else holds the plank in the right position carefully fit it into the rabbet and screw it fast with eight or ten 2 in. galvanized screws. Sink these screws into the plank until their heads are about ¼ in. below the surface, so that the plank can be planed off and the holes puttied after the hull is planked. After the plank is fastened, carefully bend it around until you can fasten the after end to the stern board, do this with the same number and size of screws. Before it is fastened be sure that the lower edge of the plank is right on line with the lower edge of the molds, fasten the plank to the molds with a couple of nails in each mold, and leave the heads of the nails out so that they can be easily withdrawn. The remaining planks are put on in the same manner, but always be sure that the bevel on the edge is placed so that the seam is slightly open on the outside but perfectly tight on the inside.

You are now ready for the bottom planks. These are the same thickness as the side planks, but they can be as wide as you can procure, for the wider they are the less you will have to caulk when the time comes. They

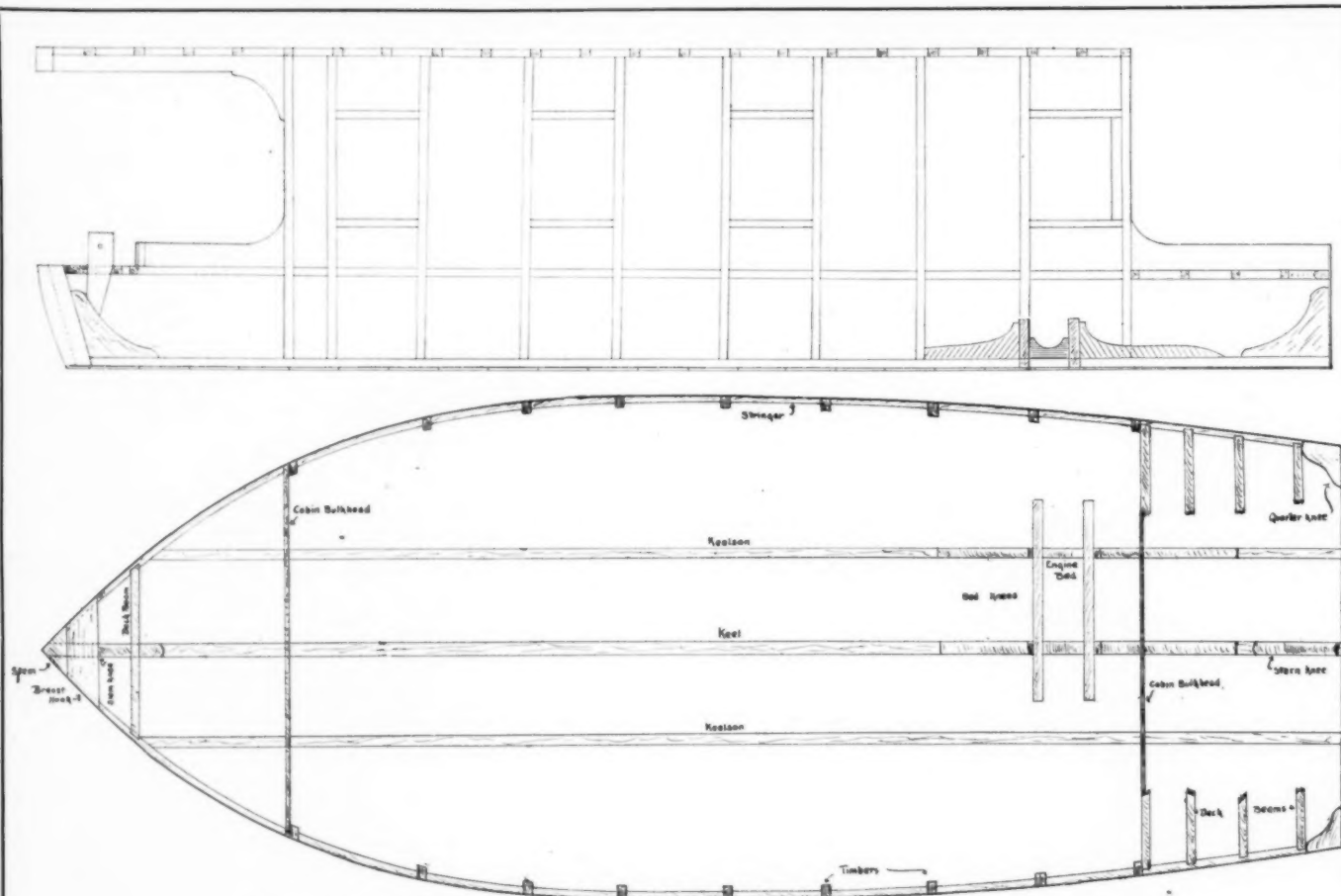
are going on across the boat so that none of them have to be over ten feet long. Screw these planks to the side planks, being sure that the screws go into the center of the side planks and don't come out on the sides, a screw every four inches is enough here as there are going to be more fastenings put in when the stringers are bent inside the hull. These planks should be beveled the same as the side planks, and great care should be taken to get the seams tight on the inside.

When all the bottom planks are on and fastened, crawl under the hull and pull out the nails in the molds and stem and stern that held the hull to the keel mold, and then get a couple of "strong arms" and turn the hull right side up. You can now take the keel mold apart and put the boards under the hull to keep the bottom planks off the floor. Put about four pieces cross ships under the bottom so that the hull won't sag between the supports. As the molds are no longer necessary you can take them out, but first nail six or eight good strong pieces of wood right across the top of the planks from side to side so that the hull will not go out of shape when the molds are removed. Now take out the molds and lay them aside but don't destroy them as the material they are made from will come in handy for sundry little parts in the finishing of the boat.

The next pieces to get out are the stringers, make these as specified in the scantling table, and bend one in on each side of the bottom with the widest side up against the inside of the side planks; these stringers don't have to be as long as the planks, and they can be cut off about a foot from the stem, but they should run aft to the stern board.

Fasten the stringers to the side planks with 2 in. galvanized screws, putting them in from the outside, and having a screw about every six inches. A screw should now be put in through the bottom planks into the stringer, put them in so that every other screw in the bottom is in the stringer, the others being in the side planks. There are two other stringers, the same size as the bottom ones, these are run around the upper edge of the side planks, the top edge of the stringer being even with the top of the sides. These upper stringers or clamps as they are called, should be fastened through the upper strake of planking with 2 in. galvanized iron screws, spaced about three inches, or the stringer may be rivetted on with either copper or galvanized nails and burrs. The bottom or bilge stringer can also be fastened with rivets if desired, but screws are easier to handle.

You are now ready to put the inside keel and the keelsons in the boat. Get these out



Profile and plan of the 26-foot motor house boat, showing the simplicity of its construction.

of a long oak plank to the size shown in the plans and table. Fasten these three pieces in the bottom with long galvanized screws, putting them in from the outside, being sure to space the three pieces as shown in the plans. Although the inside keel is really the keel proper, there is an extra piece on the outside of the hull forward that is the same size and shape as the inside keel, except that it is only about 6 feet long. This piece should run way up to the forward edge of the stem, and should be fastened up through the stem-knee with either long bolts, or rivets. There is an exactly similar piece of wood under the stern knee. The function of these pieces is to strengthen the keel where the stem and stern knees join the hull, so be sure to make the fastenings very strong, and have plenty of them.

The hull should now be ready for the deck beams, breast-hook, and quarter-knees. The deck beams should have about a 3-inch crown, so the deck will shed any water that may come aboard. The breast-hook and quarter-knees should be fastened with long bolts or rivets, don't trust to screws to hold these important pieces as a good deal of the straining of the hull is taken up by these parts. The breast hook holds the stem and forward ends of the planking together, and the quarter-knees hold the stern and after ends of the planking from separating. The specifications for these parts are given in the table of scantlings.

If you wish you can put the engine bed in now, or you can wait until the house is built on the hull, but it will probably be a little easier to do it now. Get the bed out of good strong stuff according to the specifications given and fasten it with either long bolts going all the way through the bottom or else by long copper or galvanized rivets at least $\frac{1}{4}$ inch in diameter, with large washers underneath.

The hull should now be turned over again. If it is too heavy to turn completely over,

you can turn it up on one side, so that you can get at the bottom to caulk it. If you have never done a caulking job it would pay you to have the job done by some one who thoroughly understands the work, but if you wish to try your hand at the work it would be better if you could go to some shop where you can watch the workmen caulking a boat. As the seams should be tight on the inside and open on the outside, due to the hevel you planed on them before you put on the planks, the caulking should be comparatively easy, but be sure that you do not drive the cotton in so hard that it comes through on the inside, for if it does the spot will always leak.

After the hull is caulked you can turn the boat back again, but first put a priming coat of paint over the planks that have been caulked. If the place where you are building the boat is any distance from the water you had better move the hull to the waters edge as the addition of the house will make the boat so heavy that it would be rather difficult to move any distance.

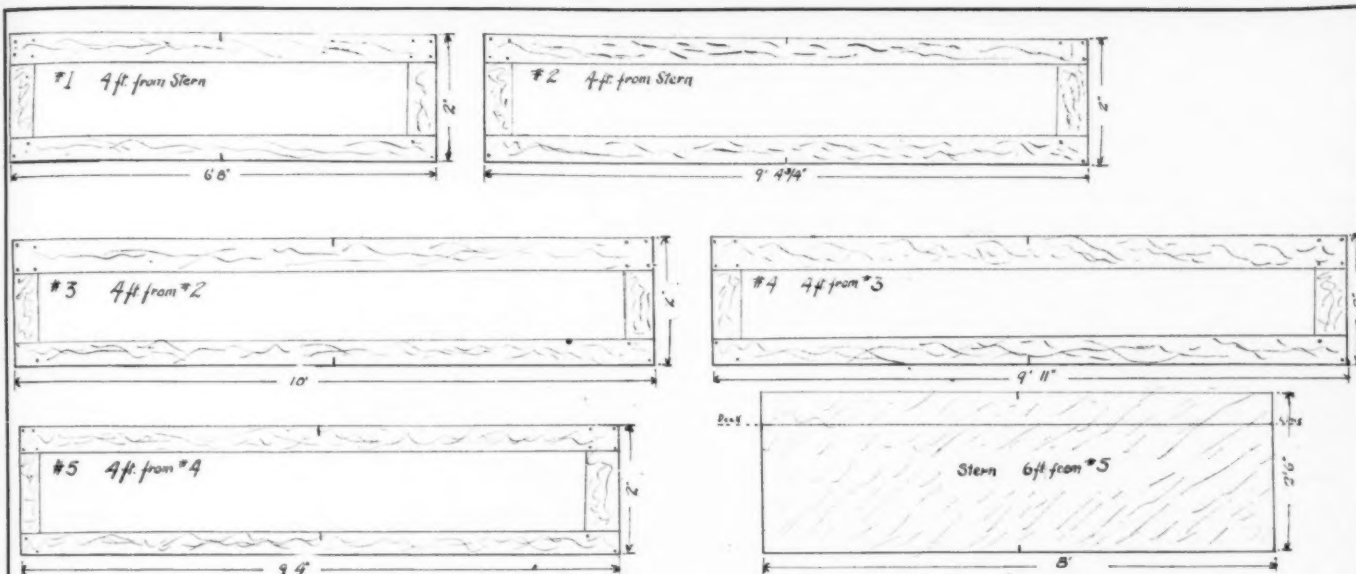
If you have the hull all done the next step will be to put up the house beams; these should be spaced as shown in the plans, and should be fastened at each stringer with a bolt or rivet, and the planking should be screwed to the beams at intervals of about 6 inches. The house beams should be a little over 6 feet 6 inches long and a stringer the same size as the hull stringer should be run around them on the inside. The top of the stringer should be exactly 6 ft., 6 in. from the bottom of the boat on the inside. This stringer can be rivetted, bolted, or screwed to the house beams.

The next step is to put up the house siding. This is the regular lapped siding that is used in all frame-house work, and you can nail it to the beams with galvanized wire nails (never use any black iron fastenings in boat work). Be sure that you leave a space where the windows and doors are going to come.

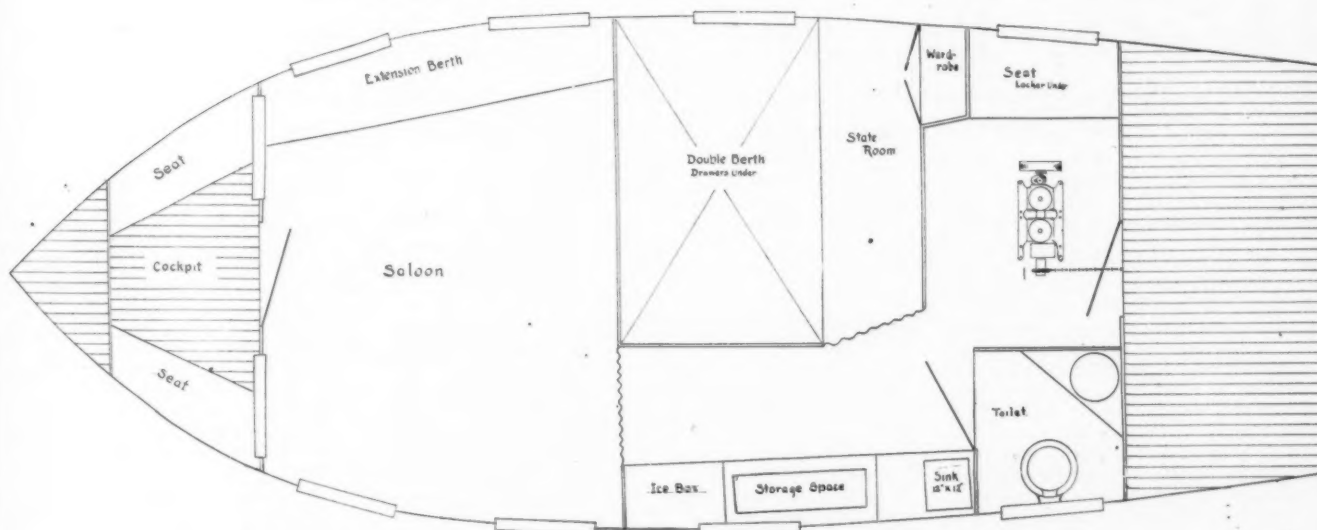
After getting the sides all planked you can put up the upper deck beams; these pieces should have the same crown as the forward and after deck beams, and they should be in one length and run from side to side. A jog or notch can be cut in the stringer, and a similar notch cut in the deck beam so that the beam can be let in flush with the top of the stringer. The beams can be nailed or screwed to the stringer from the top. If you wish to put the skylight on as shown in the drawing you will have to make a frame for it the same as the window frames. The best location for the skylight is just over the partition that divides the state room from the saloon, as this arrangement provides light and air for both compartments.

The floor in the cabin can now be laid; it should be made of regular tongue and grooved flooring, either yellow pine or spruce. The floor beams should run from side to side and should be supported at the ends by being fastened on top of the bilge stringer, the beams will also need some support under the center, this can easily be done by cutting some pieces of wood just long enough to reach from the bottom of the floor beam to the top of the keel, and nailing them fast with wire nails. The beams themselves should be spaced not more than a foot and a half apart. Some of the flooring must be left loose so that a bilge pump can be put down under the floor to take care of any water that may leak in; a good way to do this is to nail three or four of the floor boards together and put a few cleats across on the bottom to hold them together.

You can now put the decking on the three decks. As this is going to be covered with canvas it is not necessary to take particular care with the fitting of the various pieces, as long as they are fitted so there are no very large seams. The decking should be nailed to the deck beams, and the nails punched in far enough so that the heads will not rub on the canvas and cause holes to be worn in



The molds are temporary and can be made of almost any one-inch stuff; the stern board is of one-inch oak.



The interior arrangement has been laid out with a view of utilizing all the available space.

it. Before you put on the canvas it would be wise to paint the deck planks with a good thick white lead paint; this will help to keep the wet out of the cabin and will make it unnecessary for the cabin top to be painted more than once a season. The canvas should be tightly stretched over the roof and turned down on the sides and tacked; the tack heads can then be covered over with a half round moulding.

Before you lay the forward deck you must fit in the sampson post or bitt; this must be very well fastened as the boat will have to ride anchor from this post, and if it is not strong you may find your boat on the rocks some morning after a stormy night. The method of fastening shown in the drawing of the "inboard profile" is as good as you can find, as the post is dovetailed into the stem and cannot come out without pulling the whole forward end of the boat off. Simply dovetailing the post into the stem-knee is not enough as the post must be so fastened that it cannot by any chance pull up and out.

After the deck is laid you can fasten on the forward part of the coaming (the sides of the coaming are simply continuations of the house planks), and stave up the bulkhead, leaving an opening to be closed by a door that will allow the space under the forward deck being used for storage. Stave up the sides of the cockpit also and build the locker seats as shown in the plan.

The doors and windows are the next parts to be set up, and if you have not had any experience in the making of these parts it would be wise for you to purchase these from some mill where they make a specialty of house trim. The windows and doors are to be hung in the same manner that a regular house door or window is hung, and an inspection of your windows at home will teach you more about window hanging than I could tell you in a page of text. If you don't want to go to the trouble of the regular drop sash, you can have the whole window in one piece and screw a couple of hinges at the upper edge so that it can be swung out to form a sort of awning. This method has a good many advantages over the regular sash, and the window can be left open on rainy days. This style of window is much easier to make and it is less likely to stick.

After the doors and windows have been hung you can turn your attention to the interior, and while the boat has been laid out with a view to having the greatest amount of room inside, it may be that you have your own ideas about how the interior should be laid out. If so, go ahead, but be careful that you don't get the weights all on one side or all at one end; if you do you will find that the boat will trim badly when you launch her. If this does happen the best way to remedy it would be to shift the gasoline and water tanks to a different position on the upper deck till the hull comes to its proper water

line, of course the tanks must be full when you make the test.

When the interior is completed you can start in on the propelling machinery. First fasten the two stern wheel supports to the sides of the boat; be sure to get these pieces out of heavy stock as the whole weight of the wheel is hung from them. Also be sure to have a heavy block of wood on the inside of the plank to run your bolts through or else the supports will pull out when a strain is put on them, as the bolts will pull through the thin side planking if they are not backed with a heavy block. Connect the two outer ends of the supports with either a long iron bolt or a strong piece of oak securely fastened. Also make and hang the rudders, one on each corner, and run the tillers through the stern board and connect them on the inside so that one tiller will operate the two of them at once.

While the construction of the stern wheels may look difficult you will find that they are easier to make than may seem. The metal parts of the wheels must be made in a blacksmith shop and the gears you will have to get from a machine shop, as they must be cut from steel. The wooden parts are of oak, and great care should be taken to see that only the best quality of timber is used in their construction, and also that all parts are made exactly alike, so that you can carry a few extra parts on board in case you run on a rock.

When you are having the shaft made of $1\frac{1}{2}$ in. steel, have three keyways cut in it, one in the center for the gear wheel and two longer ones on the outside for the paddles. The two keyways for the paddles should be cut so that one paddle will be slightly in advance of the other, so that one of the buckets will be entering the water just as the other is coming out; this will overcome the vibration that is so often felt in boats driven by stern wheels.

The bearings at the outer ends of the shaft should be babbitted and grease cups should be fitted so that an occasional turn will keep the bearings from heating up and causing power losses. As the drive is by chain there is a liability that the chain will carry more or less water into the boat; to obviate this it is well to make a tin trough that will fit closely around the chain and will carry off any water that may come aboard; the trough can be arranged to drain overboard. The big wooden spray guard that is fitted just forward of the wheels is arranged so that it can be instantly removed so that the wheels can be inspected or repaired. As the chain will wear into the stern board if not prevented,

it would be wise to fasten a block of wood directly under the opening in the stern where the chain comes through.

Table of Scantlings.

Molds, 1 inch thick; any wood.
Stem, sided 3 inches; oak.
Stern knee, sided 3 inches; oak.
Stern board, 1 inch thick, $2\frac{1}{2}$ feet high; oak.
Stern knee, sided 3 in.; oak.
Planking, 1 in. thick; cedar, pine or cypress.
Stringers, $1\frac{1}{2}$ by $2\frac{1}{2}$ in.; spruce or yellow pine.
Keel, $2\frac{1}{2}$ by 3 in.; oak.
Keelsons, 2 by $2\frac{1}{2}$ in.; oak.
Deck beams, 2 by 2 in.; oak or spruce.
Breast hook, 2 in. thick; oak.
Quarter knees, 2 in. thick; oak.
Engine bed, 2 in. thick; oak or spruce.
House beams, 2 by 3 in.; spruce.
Floor beams, 2 by 2 in.; spruce.
Decking, 2 by 1 in.; pine or spruce.
Sampson post, 6 by 6 in.; locust or oak.
Stern wheel supports, 6 by 2 in.; oak.
Rudders, 1 in. thick; oak.

Stern Wheel dimensions.

Diameter, 4 feet.
Width, 3 ft. each.
Spaced on shaft, 1 ft.
Spokes, $1\frac{1}{2}$ by $1\frac{1}{2}$ in.; oak.
Buckets, 1 in. thick, 1 ft. wide, 3 ft. long; oak.
Ratio of gearing between engine and wheel, 5 to 1, r.p.m. of wheel, 100.

Dimensions of boat.

Length over all, 26 ft.
Water line length, 25 ft. 6 in.
Beam, 10 ft. 2 in.
Depth of hull, 2 ft.
Draft, 3 in.
Headroom in cabin, 6 ft. 4 in.
Forward deck, 2 ft. long.
Cockpit, 3 ft. long.
After deck, 4 ft. long.
Saloon, 7 ft. long.
State room, 6 ft. long, 6 ft. 6 in. wide.
Engine room, 4 ft. long.
Toilet, 3 ft. long, 3 ft. wide.
Passage and galley, 7 ft. long, 3 ft. 6 in. wide.
Windows, 2 by 2 ft.

Motor Boating in the Concrete.

The Interesting Application of Re-enforced Concrete in the Construction of a Small Motor Boat.
A Type of Craft in Perfect Harmony with the Stolidity of Her Dutch Builders.

ALTHOUGH the use of concrete in the construction of boats is not in itself a new idea, having been employed for several years in the building of barges which have been used successfully on the inland waterways of Italy, its application in the motor boat field is decidedly novel.

The boat shown in the photograph was built recently in Holland, by the cement firm of A. Last & Sons of Enkhuizen, and is, so far as we know, the only motor boat ever constructed of concrete.

In the lower picture is shown the framework of the boat ready for the cement. It is made of a number of iron rods attached to an iron keel and running transversely and longitudinally, to which are secured an outer and an inner skin of wire netting. The cement was applied to the framework in much the same way as plaster is applied to the

lath in the finishing of houses, and after this had thoroughly hardened, which took several weeks, it was given five coats of a specially prepared paint. Note the framework for the transverse floors in the after part of the hull

and the supports for the seats ready to be imbedded in the concrete.

The seats, forward deck, the transom and the covering boards are of wood, and after the boat was finished a wooden housing was made for the motor installed amidships as shown in the upper illustration.

The gasoline tank is installed under the forward deck and there seems to be no provision for air chambers anywhere in the hull, which is the principal criticism of the boat. It's original, though, there can be no doubt that, and after all the inland waterways and canals of Holland don't kick up very much of a sea.

The boat is a 15 footer of 5 ft. 4 in. beam and 2 ft. 3 in. depth and cost approximately \$83. The engine is a 3 h. p. machine, giving the boat a speed of six knots—not a breathless pace to be sure, but probably sufficient for her stolid skipper.



The frame work of the concrete motor boat consists of iron rods over which is stretched an outer and an inner skin of wire netting.

Lubricating Systems.

The Requirements of a Successful Oiling System and a Consideration of Those Now in Vogue. Supplemented by Data Obtained From the Engines Exhibited at the New York Motor Boat Show.

By J. Edward Schipper.

THE maintenance of the oil film on certain parts of the modern Gas and Gasoline engine has not as yet been resolved down to a single final and standard system.

Before we start to discuss the methods of maintaining this film of oil and of replacing it as it is burned away or as it flows away, let us first examine its uses and qualities. As we all know, where there are two metal surfaces working one upon the other it is necessary to separate them so that they are not actually in contact with one another. This is especially so in the case where the bearing surfaces do not roll but slide over each other. The method used to separate the two bearing surfaces is to place between their faces a film of lubricating material.

An absence of this lubricating material gives rise to conditions which are disastrous to the engine; especially in the case where fibrous metals are involved. Cast iron, from which a majority of the successful gas engine cylinders are made is not a fibrous metal and when it is not properly lubricated, will "squeal" long before it is actually harmed. Steel, however, which is a fibrous metal, will tear, score and warp without any warning except excessive overheat.

Our problem is to lubricate the bearings sufficiently so that we will operate our engine at a reasonable running temperature, to keep each bearing sufficiently and evenly cooled and to prevent a waste or an uneconomical use of our lubricating fluid. The cylinder is the most difficult and the most important part to oil properly and efficiently.

In designing an oiling system for the cylinder we must remember that where we want most of our oil is at the hottest part of the cylinder which is covered by the piston in its stroke, and it is right here that a great many of the present-day oiling systems strike their first weak spot. As the piston descends on the power or explosion stroke, every vestige of lubricating matter in the combustion space is burnt and destroyed as a lubricant. This naturally has to be replaced in order to prepare for the piston as it ascends on its up stroke. How are we going to put it there? There are several methods in vogue but they hinge on two or three primary principles. Let us divide our engines into four different general classes and take up separately the problems entering into the cylinder lubrication of each, and the methods in use at the present time to solve them.

Our classification will be as follows: Low power two cycle, high power two cycle, low power four cycle, and high power four cycle. We cannot, of course, draw a sharp line distinguishing between high and low power engines but by dividing them in this manner and then considering a representative engine of each of these different types we can approach the subject in an intelligent manner.

We will consider first the low powered two cycle engine. This class without doubt is the most popular with a large majority of small boat owners; and yet, has probably been the least considered from a lubricating standpoint. Most small two cycle engines are built with the special intention of having them as low priced as they can possibly be placed upon the market. In saying this it does not necessarily mean that the actual quality of the engine suffers. There is too much competition in the small two cycle engine builder's field to permit of this, but, it does mean that every bit of weight, every piece of extra material and every unnecessary part that it is in any way possible to eliminate, has been omitted from the finished product.

This is just as true of the oiling and lubricating systems as it is of the engine itself and this, therefore, is our first factor in the consideration of low powered two cycle engine oiling systems.

The man who owns and operates his own small motor boat is not always by any means an accomplished engineer, in fact the many sad experiences which can be seen along the banks of river, sound and lake on a hot summer afternoon is evidence enough to satisfy the most exacting person alive that simplicity and positive action in each and every part of a small motor should be the height of ambition of every engine builder who cherishes any aspirations of remaining popular with his clients. This, then, is the second consideration, namely, that of simplicity and ease of operation. It is understood of course, that the system is to perform its office in a satisfactory manner. This is of prime importance and the others follow.

We have stated three primary facts from which to draw our conclusions for our first type of engine, the low powered two cycle. The system must lubricate, be cheap, simple and easily operated. These are the most important; afterward come the consideration of regulation of supply, economical use of oiling fluid and accessibility.

The present day engine builders meet these considerations in the following ways: by a mechanical oiler driven either by connecting rod from an auxiliary shaft or by gear or belt from the main shaft; by gravity oil cups feeding directly to the cylinders; by introducing the lubricating fluid into the intake manifold; by mixing the lubricating fluid with the gasoline in the tank; by splash from the crank case and by pressure from the crank case to force oil into cylinder.

Each of these methods has its supporters but we believe that in the two cycle engines, builders are coming more and more to the practice of putting the oil into the cylinder along with the fuel either at the intake manifold or by mixing it up in the tank, where, by the way, it remains in solution and does not stratify as so many are inclined to believe.

The oil is sucked into the crank case with the gas and is vaporized and passes as a vapor through the by-pass into the cylinder. If we "take down" an engine lubricated in this manner we find the oil deposited in minute beads all over the cylinder walls, showing a very evenly distributed lubricating action. By this method we do get the oil above the piston on the up stroke, a matter which we considered above.

When admitted with the fuel the operator has nothing to worry about in the line of oil cups. He does not forget to shut off the oil and have it pour into his cylinder as is so often the case with gravity cups. All that it is necessary to do is to put it into the tank and stir it up in the proper proportions, i. e., a pint of oil to about five or occasionally seven gallons of gasoline.

Many people put gravity cups on their intake pipe; this in the opinion of others, is just a half step in the right direction. Why not put it directly into the gasoline and do away altogether with the objectionable features of gravity oil cups? This is the questions which is asked by those who put the oil into the gasoline tank directly. There are reasons for and against the putting of oil cups on the intake manifolds and opinion on the subject seems to be very evenly divided, as to the relative merits of both methods.

One question which is asked by the gravity feed men is whether or not the charge is not

diluted by the addition of oil. It does not seem to us that the charge is in any way diluted because we are not taking away any perceptible amount of gasoline, but are merely adding oil. The oil of course is burned much the same as the gasoline, and our supply of air must be regulated to correspond to the new quality of fuel. As the oil is in solution the action of the needle valve of the carbureter should not in any way be clogged or impeded.

Now let us turn to the second classification which we have named as the high powered two cycle engine.

The only difference is in the complexities due to the increase in size of the engine as the principles underlying are exactly the same. The methods adopted by the manufacturers are the same as we have already named, but there is more of a tendency to employ the mechanical feeds in these engines than there was in the smaller motors. This of course is natural as the prices of the larger engines warrant the makers putting on the more expensive force feed systems. The gravity systems find favor, too, with many as do also the methods of admitting the lubricating material with the fuel which we have explained. The method which is in vogue among some builders of forcing the oil into the cylinders by means of crank case pressure is not now in such extensive use as it was at one time.

In closing our discussion of two cycle cylinder lubrication we may say that developments all along have been in the direction of putting the amount of oil supplied at different speeds up to the designer and not to the operator. That is to say, the faster the engine turns over the more the oil is supplied automatically.

The remaining two classes, namely, the high and low powered four cycle engines are not separated from the two cycle engines by any marked difference in their oiling problems. In fact the list of methods given applies nearly as well to the four cycle as to the two, except that the method of introducing oil with the charge is not as applicable to the four cycle type on account of there being no crank case pressure to help completely vaporize the oil.

The splash system is much used and in multi-cylinder engines the base is divided up into a number of reservoirs from which there is a fixed overflow. The oil flows to one end of the crank case and is pumped back to the other end to flow down again, using the same oil over and over again. In fact, sometimes this pump is given a capacity of about two gallons a minute and leads the oil back through a pipe above the main bearings. The pipe has an orifice at a point above each of the crank bearings, and the oil comes out in a stream which lubricates and cools the bearing and furnishes enough excess to keep the inside of the engine base filled with a spray of oil. It is not necessary in this particular type to have any additional oil to form the "splash" in the bottom of the engine foundation, except where the aid of oil as a cooling agent is desired.

In the force feed system the oil is pumped from the engine base up to a pipe in the receiving tank. This pipe terminates in the upper part of the tank behind an observation glass and is perforated with a series of small penings the size of which is often controlled by a small valve. The oil drips or pours out of these holes into pipes directly below and separated from them by a small space. The operator by looking through the observation glass ascertains the amount of oil dripping into each pipe. The oil flows finally into the base and is drawn through the system again

(Continued on page 76.)

Lubricating Systems.

Engines Exhibited at the New York Motor Boat Show and How They Were Lubricated.
A List of Motors That Are Thoroughly Representative of American Practice.

| Maker and Engine. | H. P. | No. of Cyl. | Bore and Stroke. | Method of Lubrication. |
|------------------------------|---------|-------------|------------------|---|
| Anderson Engine Co..... | 24 | 4 | 5 x 6 | McCanna mechanical oiler—driven by connecting rod from cam shaft, feeding cylinders, crank shaft and bearings. |
| | 12 | 2 | 5 x 6 | Ditto. |
| | 4 | 1 | 4½ x 5 | Ditto. |
| Royal Engine Co..... | 2½ | 1 | 3½ x 4 | Gravity oil cup to cylinder and grease cups on bearings, splash in base. |
| | 15 | 2 | 5½ x 6 | Gravity feed to ring oiler in crank case, grease cups on main bearings. |
| | 5-6 | 2 | 3½ x 4 | Ditto. |
| | 5 | 1 | 4½ x 5 | Ditto. |
| | 7 | 1 | 5½ x 6 | Ditto. |
| | 10 | 2 | 4½ x 5 | Ditto. |
| V. J. Emery, Ideal | 40 | 4 | 7 x 7 | Osgood mechanical oiler—driven by belt from cam—to cylinder and crank case. Compression cups on main bearings. |
| Grand Rapids G. E. & Y. Co. | 5 | 1 | 5 x 6 | Gravity feed to cylinders, grease cups on bearings. |
| Monarch | 14 | 2 | 5 x 6 | McCanna mechanical oiler—driven by belt from cam shaft, feeding cylinder and main bearings. |
| Van Blerck Motor Co..... | 50-60 | 4 | 5½ x 6 | Lavigne mechanical oiler—shaft driven from cam shaft feeding cylinder and bearings. |
| General Mch. Co., Smalley.. | 35-50 | 4 | 4½ x 4½ | Detroit mechanical oiler—belt driven from crank shaft feeding cylinder and case. Compression cups on main bearings. |
| | 20-29 | 2 | 5½ x 5½ | Grease cups to bearings, gravity oilers to cylinders and crank case. |
| | 12-15 | 2 | 4½ x 4½ | Ditto. |
| Termaat & Monahan, T. & M.. | 8 | 2 | 4 x 4 | Grease cups to bearings, lubrication through intake manifold. |
| | 3 | 1 | 3½ x 3½ | Grease cups to bearings, lubrication through the gasoline. |
| | 3 | 1 | 3 x 3 | Ditto. |
| Watkins Motor Co..... | 6 | 2 | 3 x 3 | Grease cups to bearings, oil cups on intake manifold. |
| | 3 | 1 | 3 x 3 | Ditto. |
| The Stanley Co..... | 10 | 2 | 5½ x 4½ | Gravity multiple feed to cylinder and bearings. |
| | 14 | 2 | 5½ x 4½ | Ditto. |
| | 3 | 1 | 4 x 3½ | Grease cups to bearings, individual oil cups to cylinder and crank case. |
| | 5 | 1 | 4½ x 5 | Ditto. |
| | 6 | 2 | 4 x 3½ | Gravity multiple feed to cylinder and bearings. |
| | 7½ | 1 | 5½ x 6 | Ditto. |
| | 15 | 2 | 5½ x 6 | Ditto. |
| | 7 | 2 | 4½ x 3½ | Ditto. |
| Gray Motor Co..... | 3 | 1 | 4 x 3 | Gravity double feed to cylinder and crank case. |
| | 12 | 2 | 4½ x 4 | Sight feed oil cups, gravity to cylinder and case. |
| | 36 | 3 | 3½ x 5 | Through the gasoline. |
| | 4½ | 1 | 4 x 4 | Gravity double feed to cylinder and crank case. |
| | 6 | 1 | 4½ x 4 | Ditto. |
| | 7 | 1 | 4½ x 4 | Through the gasoline. |
| | 8 | 2 | 4½ x 5 | Detroit mechanical oiler and grease cups. |
| | 8 | 1 | 4½ x 5 | Through the gasoline. |
| | 12 | 1 | 5½ x 5 | Through the gasoline. |
| | 14 | 2 | 4½ x 4 | Ditto. |
| | 24 | 2 | 5½ x 5 | Ditto. |
| | 21 | 3 | 4½ x 4 | Ditto. |
| Wolverine Motor Works.... | 50 | 2 | 9½ x 12 | Manzel mechanical oiler—leading to ring oilers in crank case. Grease cups on bearings. |
| | 5 | 1 | 5½ x 6 | Pressure oiler, splash in base. |
| | 36 | 3 | 8½ x 9 | Manzel mechanical oiler—(as above) ratchet driven by vertical shaft from cam shaft. |
| | 12 | 2 | 6½ x 7 | Ditto. |
| S. M. Jones, Ralaco..... | 10 | 2 | 4 x 6 | Self contained pump oiler with splash. |
| | 20 | 4 | 4 x 6 | Ditto. |
| | 30 | 4 | 7 x 9 | Ditto. |
| Stamford Motor Co..... | 3 | 1 | 4½ x 4½ | Gravity cups on cylinder, hand pump oil cup on crank case, grease cups on bearings. |
| | 8 | 2 | 5½ x 6 | Ditto. |
| | 8 | 2 | 4 x 5 | Ditto. |
| | 14 | 2 | 6 x 6 | Ditto. |
| Fairbanks, Morse & Co..... | 3½ | 1 | 3½ x 3½ | Gravity oil cup to cylinder and grease cups on bearings. |
| | 7 | 2 | 3½ x 3½ | Ditto. |
| | 6 | 1 | 4½ x 4½ | Essex force feed—with pressure from crank case. Grease cups on bearings. |
| | 12 | 2 | 4½ x 4½ | Essex force feed—with pressure from crank case—to cylinder and main bearings. |
| | 18 | 3 | 4½ x 4½ | Ditto. |
| | 24 | 4 | 4½ x 4½ | Detroit mechanical oiler—belt driven from main shaft, to cylinders and main bearings. |
| | 4½ | 1 | 4½ x 4½ | Gravity oil cups and grease cups. |
| | 18 | 4 | 4½ x 4½ | Rotary pump to cylinder and main bearings—splash. |
| | 20 | 2 | 7½ x 8 | Gravity multiple feed. |
| Van Blerck Motor Co..... | 12-15 | 2 | 5 x 6 | Lavigne force feed—vertical shaft driven from cam shaft—to all bearings. |
| | 25-35 | 4 | 5 x 6 | Ditto. |
| | 35-45 | 6 | 5 x 6 | Ditto. |
| | 40-60 | 4 | 5½ x 6 | Ditto. |
| | 60-80 | 6 | 5½ x 6 | Ditto. |
| Chas. L. Seabury, Speedway.. | 60 | 6 | 6 x 6 | McCord force feed—to all bearings. |
| | 300 | 6 | 11 x 12 | Ditto. |
| | 22 | 4 | 4½ x 5 | Ditto. |
| | 5 | 1 | 4½ x 5 | Ditto. |
| Ferro Mch. & Foundry Co.... | 3 | 1 | 3½ x 3½ | Gravity sight feed on inlet, grease cups. |
| | 4 | 1 | 3½ x 3½ | Pressure oiler from crank case—reservoir in base. |
| | 5½ | 1 | 4½ x 4½ | Ditto. |
| | 7½ | 1 | 5 x 5 | Ditto. |
| | 8 | 2 | 3½ x 3½ | Ditto. |
| | 11 | 2 | 4½ x 4½ | Ditto. |
| | 15 | 2 | 5 x 5 | Ditto. |
| | 12 | 3 | 3½ x 3½ | Ditto. |
| | 17 | 3 | 4½ x 4½ | Ditto. |
| | 25 | 3 | 5 x 5 | Ditto. |
| Electric Launch Co..... | 70 | 6 | 5 x 4½ | Gear pump with reservoir in base—self contained. |
| Standard Motor Cons Co.... | 25 | 4 | 4 x 5½ | McCord force feed—eccentric from cam shaft—all bearings. |
| | 8 | 2 | 5 x 6½ | Mechanical (own make) by worm from cam shaft. |
| | 16-20 | 4 | 5 x 6½ | Ditto. |
| | 25-32 | 4 | 6 x 8 | Ditto. |
| | 40-50 | 6 | 6 x 8 | McCord force feed—eccentric from cam shaft—all bearings. |
| | 100-125 | 6 | 8½ x 11 | Ditto. |
| | 39 | 6 | 4 x 5½ | Ditto. |
| Regal Gasoline Co..... | 6 | 2 | 4 x 4½ | McCord force feed—by eccentric from cam shaft—to cylinders and all bearings. |
| | 8 | 2 | 4½ x 4½ | Ditto. |
| | 24 | 4 | 5½ x 5½ | Ditto. |
| | 5 | 1 | 5½ x 3½ | Gravity oil cup feeding cylinders—ring oiler to bearings. |
| | 10 | 2 | 5½ x 5½ | McCord force feed—by eccentric from cam shaft—to cylinders and all bearings. |
| | 14 | 2 | 6½ x 7 | Ditto. |
| | 28 | 4 | 6½ x 7 | Ditto. |
| Lamb Engine Co..... | 60 | 6 | 6½ x 7 | Detroit force feed—driven by rod from cam shaft gear wheel, to all parts. |
| | 20 | 2 | 6½ x 7 | Ditto. |
| | 65-70 | 6 | 5½ x 6 | Ditto. |
| | 35-40 | 4 | 5½ x 6 | Ditto. |
| | 24 | 4 | 5½ x 6 | Ditto. |
| | 18 | 3 | 5½ x 6 | Ditto. |
| | 12 | 2 | 5½ x 6 | Ditto. |
| | 10 | 2 | 4½ x 6½ | Ditto. |
| Holmes Motor Co..... | 20-25 | 6 | 6 x 8½ | Manzel mechanical oiler—driven by vertical rod from cam, to all parts. |
| | 55-60 | 4 | 6 x 8½ | Ditto. |
| | 20-25 | 4 | 4½ x 6½ | Ditto. |
| Blount & Lowell..... | 22 | 4 | 5½ x 6½ | Self contained pump oiler with splash. |
| | 15 | 3 | 5½ x 6½ | Ditto. |
| | 32 | 6 | 8½ x 6½ | Ditto. |

| Maker and Engine. | H. P. | No. of Cyl. | Bore and Stroke. | Method of Lubrication. |
|------------------------------|---------|-------------|------------------|---|
| Scripps Motor Co..... | 4 1/2 | 1 | 4 1/2 x 5 | Detroit mechanical oiler—driven from cam by vertical shaft, feeding everything. |
| | 9-13 | 2 | 4 1/2 x 5 | Ditto. |
| | 24-48 | 4 | 5 1/2 x 6 | Ditto. |
| | 48-72 | 6 | 5 1/2 x 6 | Ditto. |
| | 27-45 | 6 | 4 1/2 x 5 | Ditto. |
| | 7-9 | 1 | 5 1/2 x 6 | Gravity feed oil cups to cylinders and bearings. |
| | 12-18 | 2 | 5 1/2 x 6 | Detroit mechanical oiler—driven from cam by vertical shaft, feeding everything. |
| Reynolds Motor Co..... | 15-20 | 4 | 3 1/2 x 4 1/2 | Pressure oiler—(Precision Appliance Co.) eccentric driven from magneto shaft, feeding everything. |
| Mietz & Weiss..... | 75 | 3 | 10 x 12 | Two chain driven oilers for cylinders, crank case and bearings. |
| | 3 1/2 | 1 | 4 x 4 1/2 | Grease cups to all bearings and gravity oilers to cylinders and crank case. |
| | 10 | 2 | 4 1/2 x 6 1/2 | Same as 75 horse power, except that Dodge lubrication is used. |
| Kent Engine Co..... | 15 | 2 | 6 x 8 | Detroit mechanical lubricator—driven by eccentric from cam shaft, feeding cylinder and bearings. |
| | 30 | 4 | 6 x 8 | Ditto. |
| | 45 | 6 | 6 x 8 | Ditto. |
| Fulton Engine Co..... | 2 1/2 | 1 | 3 1/2 x 4 | Gravity oil cups to cylinders, grease cups on bearings. |
| | 10 | 2 | 4 1/2 x 5 | Ditto. |
| Clifton Motor Works..... | 14 | 2 | 6 1/2 x 7 | Detroit gravity multiple feed to bearings, cups to cylinders. |
| | 20 | 3 | 5 x 6 | Self contained rotary pump. |
| | 65 | 3 | 8 1/2 x 11 | Detroit mechanical oiler—eccentric driven from crank shaft, feeding everything. |
| Hall Gas Engine Co..... | 6 | 1 | 5 x 6 1/2 | Gravity oil cups to cylinders and to ring oiler for connecting rods, oil well on main bearings. |
| | 13 | 2 | 5 1/2 x 6 1/2 | Manzel mechanical oiler—belt driven from cam shaft, feeding cylinder and connecting rods, through ring oiler. |
| | 23 | 4 | 5 1/2 x 6 1/2 | Detroit ratchet driven from cam shaft, feeding everything, grease cups on bearings. |
| Loew Mfg. Co., Victor..... | 15-30 | 4 | 4 1/2 x 5 | Self contained rotary pump in oil well with a jet feeding everything. |
| | 25-40 | 4 | 4 1/2 x 5 1/2 | Ditto. |
| | 36-60 | 6 | 4 1/2 x 5 1/2 | Ditto. |
| Jencick Motor Mfg. Co..... | 40 | 4 | 5 x 5 1/2 | Detroit force feed oiler, vertical gear driven shaft from cam shaft, splash. |
| | 150 | 6 | 7 1/2 x 7 1/2 | Same as above with Brown and Sharp rotary pump in base for bearings. |
| Emerson Engine Co..... | 10 | 1 | 4 x 5 | Gravity double feed to cylinders and crank case, compression cups on main bearings. |
| | 20 | 2 | 5 x 5 | Ditto. |
| | 40 | 4 | 5 x 5 | Detroit mechanical oiler—belt driven from main shaft, feeding cylinders and case, cups on bearings. |
| | 100-125 | 6 | 5 x 5 | Ditto. |
| | 50-100 | 4 | 7 1/4 x 8 | Detroit Special eccentric driven from cam shaft, feeding cylinders, oil well on main bearings. |
| Dean Mfg. Co. Fox..... | 60-70 | 4 | 5 x 5 | Through the gasoline, with grease cups on end bearings. |
| | 3 1/2 | 1 | 3 1/2 x 3 1/2 | Triple gravity feed to inlet and bearings. |
| | 14 | 2 | 3 1/2 x 5 | Ditto. |
| | 21 | 3 | 3 1/2 x 5 | Lavigne gravity sight feed to inlet pipes and main bearings. |
| | 60-80 | 4 | 4 1/2 x 4 1/2 | Through the gasoline. |
| | 7 | 2 | 3 1/2 x 3 1/2 | Multiple gravity feed to inlets and main bearings. |
| | 20 | 2 | 5 x 5 | Gravity feed to inlet pipe, compression cups on main bearings. |
| | 5-7 | 1 | 3 1/2 x 5 | Ditto. |
| Automatic Mch. Co..... | 6 | 1 | 5 1/2 x 7 | Individual gravity feed to cylinders, oil well on main bearings. |
| | 12 | 2 | 5 1/2 x 7 | Ditto. |
| | 75 | 3 | 10 x 14 | Ditto. |
| | 50 | 4 | 7 1/2 x 9 | Ditto. |
| | 37 1/2 | 3 | 7 1/2 x 9 | McCord multiple force feed—ratchet driven by rod from make-and-break mechanism. |
| | 18 | 3 | 5 1/2 x 7 | Individual gravity feed to cylinders, oil well on main bearings. |
| | 25 | 2 | 7 1/2 x 9 | Ditto. |
| Torrey Roller Bushing Works | 2 | 1 | 3 1/2 x 4 | Gravity oil cups on cylinders and crank case, grease cups on bearings. |
| | 6 | 2 | 4 1/2 x 4 1/2 | Ditto. |
| | 4 | 2 | 3 1/2 x 4 | Ditto. |
| | 3 | 1 | 4 1/2 x 4 1/2 | Ditto. |
| | 5 | 1 | 5 x 6 | Ditto. |
| | 10 | 2 | 5 x 6 | Ditto. |
| | 8 | 1 | 6 1/2 x 7 | Ditto. |
| | 16 | 2 | 6 1/2 x 7 | Ditto. |
| Palmer Brothers | 3 1/2 | 1 | 4 1/2 x 4 1/2 | Through the gasoline, grease cups on main bearings. |
| | 5 | 2 | 3 1/2 x 3 1/2 | Ditto. |
| | 20 | 3 | 5 x 6 | Ditto. |
| | 3 1/2 | 1 | 4 1/2 x 4 1/2 | Ditto. |
| | 2 | 2 | 3 1/2 x 3 1/2 | Ditto. |
| | 15 | 3 | 3 x 6 | Detroit mechanical oiler—belt driven from main shaft. |
| | 13 | 3 | 4 1/2 x 4 1/2 | Through the gasoline, grease cups on main bearings. |
| | 2 | 1 | 3 1/2 x 3 1/2 | Ditto. |
| Mianus Motor Works | 5 | 1 | 4 1/2 x 5 | Oil cups to cylinder and to inlet pipe. Grease cups on main bearing. |
| | 15 | 2 | 4 9/16 x 6 | Manzel force feed—gear driven from timer shaft, leading to inlet and cylinder. |
| | 20 | 2 | 6 1/2 x 7 | Detroit force feed—gear driven from timer shaft, leading to cylinder and main bearings. |
| | 3 | 1 | 4 x 4 | Gravity oil cups to cylinder and to inlet pipe. Grease cups on main bearings. |
| | 7 1/2 | 1 | 5 9/16 x 6 | Ditto. |
| | 10 | 2 | 4 x 4 | Ditto. |
| | 10 | 1 | 4 1/2 x 5 | Ditto. |
| | 10 | 1 | 6 1/2 x 7 | Ditto. |
| | 30 | 3 | 6 1/2 x 7 | Ditto. |
| Buffalo Gasoline Engine Co.. | 60 | 4 | 6 1/2 x 5 | Osgood mechanical force feed by shaft, from cam shaft—to cylinder and crank case, ring oilers on main bearings. |
| | 10 | 4 | 4 x 5 | Ditto. |
| | 3 | 2 | 3 x 4 | Detroit gravity sight feed—oil well on bearings. |
| | 40 | 6 | 4 1/2 x 5 | Manzel force feed, driven from magneto and pump shaft—to cylinder and crank case. Ring oilers on main bearings. |
| | 12 | 2 | 6 x 7 1/2 | Manzel force feed—driven from magneto and pump shaft. Oil well on main bearings. |
| | 24 | 4 | 6 x 7 1/2 | Ditto. |
| | 25 | 4 | 4 1/2 x 5 | Ditto. |
| Tuttle Motor Co..... | 2 | 1 | 3 1/2 x 3 | Gravity sight feed to cylinders and bearings. |
| | 2 | 2 | 3 1/2 x 3 | Ditto. |
| | 10 | 2 | 4 1/2 x 4 | Ditto. |
| | 15 | 3 | 4 1/2 x 4 | Ditto. |
| | 20 | 2 | 6 x 5 1/2 | Ditto. |
| | 18-20 | 2 | 4 1/2 x 4 1/2 | Through the gasoline. |
| | 36-40 | 4 | 4 1/2 x 4 1/2 | Ditto. |
| B. F. Brown Gas Engine Co.. | 60-80 | 6 | 5 1/2 x 4 1/2 | Through gasoline and sight feed to cylinders, through tube to wrist pin and connecting rod bearing. |
| | 14-16 | 2 | 5 1/2 x 4 1/2 | Ditto. |
| | 30-40 | 3 | 5 1/2 x 4 1/2 | Ditto. |
| | 15-20 | 3 | 4 1/2 x 4 1/2 | Ditto. |
| | 10-12 | 3 | 4 1/2 x 4 1/2 | Ditto. |
| Brownie | 1-1 1/2 | 1 | 2 1/2 x 2 1/2 | Ditto. |
| Ditto | 2-3 | 2 | 2 1/2 x 2 1/2 | Ditto. |
| Vim Motor Co..... | 3 | 1 | 3 1/2 x 3 1/2 | Gravity cups and grease cups on bearings. |
| | 6 | 2 | 3 1/2 x 3 1/2 | Ditto. |
| | 5 | 1 | 4 x 4 | Ditto. |
| | 10 | 2 | 4 x 4 | Ditto. |
| | 18 | 2 | 5 x 5 | Ditto. |
| | 13-15 | 2 | 4 x 4 | Ditto. |
| | 26-31 | 4 | 4 x 4 | Ditto. |
| | 35-40 | 3 | 5 x 5 | Through gasoline, grease cups on bearings. |
| | 46-55 | 4 | 5 x 5 | Ditto. |
| Vanguard Engine Co..... | 30-36 | 4 | 5 x 5 | Double force feed by pressure from exhaust, Vanguard design, sight feed to cylinder and bearings. |
| | 15-18 | 2 | 5 x 5 | Ditto. |
| Fay & Bowen..... | 5 | 1 | 4 1/2 x 4 1/2 | Gravity sight feed cups on cylinder and grease cups. |
| | 30 | 2 | 6 1/2 x 8 | Pressure from crank case to cylinder and main bearings. |
| Sterling Engine Co. | 18-25 | 4 | 4 1/2 x 5 1/2 | Manzel Mech. Oiler, with centrifugal rings driven by universally jointed shaft from cam shaft. |
| | 25-40 | 4 | 4 1/2 x 5 1/2 | Ditto. |
| | 45-65 | 6 | 5 1/2 x 6 | Ditto. |
| | 100 | 8 | 5 1/2 x 6 | Ditto. |
| | 12-15 | 2 | 5 1/2 x 7 | Ditto. |
| | 20 | 2 | 6 1/2 x 8 | Ditto. |
| | 60 | 6 | 6 1/2 x 8 | Ditto. |

(Table continued on page 56.)

\$50,000 - \$100,000 Motor Boats.

The Eleventh and Last Instalment of the Series "How Much Does a Motor Boat Cost."
Several Examples of Motor Yachts That May Be Had for Prices Within This Range.

[This instalment is the last of the "Cost Series," which was launched a year ago with the \$100 motor boat. By a number of stages we have come up from this humble craft to the very highest development of the motor yacht, three examples of which are shown herewith.—EDITOR.]

Whittelsey 160-Footer.

THE design at the bottom of the page, recently prepared by Messrs. Whittelsey & Whittelsey of New York City is of a 160-foot motor yacht which just about touches the high water mark in motor boat design. The hull is constructed entirely of steel, has a beam of 20 ft. and is equipped with two 300 h. p. motors.

In a boat of this size it is of course possible to obtain full head room in the deck house without sinking its floor below the main deck line and without giving the boat undue top-hamper, and this fact has been taken advantage of in the design. The forward compartment in the deck house is the dining saloon from which a passage leads aft to a deck saloon at the extreme after end of the house. There is a pantry and companionway to the galley just abaft the dining saloon and aft of this is the captain's stateroom which communicates directly with the pilot house above. The owner's quarters, consisting of two staterooms, a bath room and a large wardrobe, occupy the remainder of the deck house.

The accommodations below deck consist of a forecabin forward, the officer's mess room and steward's and engineer's staterooms next aft, with a galley, store room and refrigerator beneath the dining saloon. The engine room is amidships.

The living quarters aft consist of a full width double stateroom just aft the engine compartment and

connecting with the bathroom and a smaller stateroom on either side of a passage, which leads to the lobby. A similar passage leads aft from the lobby to another full width stateroom which also connects with a bathroom and a maid's stateroom similarly arranged to the layout just mentioned. It is estimated that the cost of such a boat would be \$100,000.

The Reliance 98-Footer.

A 98-FOOTER of 18 ft. beam and 4 ft. draft, recently designed by the Reliance Motor Boat Co. of New York City is shown at the top of the opposite page. The power equipment consists of two 300 h. p. motors driving twin screws and with which a speed of 20 miles per hour is expected.

There is a crowned deck forward extending to the deck house, the floor of which is on a level with the sheer line. This deck house is laid out for a dining saloon and butler's pantry connecting with the galley just beneath it. A cabin trunk extends aft over the living quarters, giving ample light and ventilation and the forward part of this cabin trunk is utilized as a bridge deck. The engines are installed beneath the bridge deck and divide the boat into two parts, that forward being occupied by the forecabin, officer's stateroom and galley and that aft being devoted to the living quarters. Amidships there is a saloon and full width stateroom connecting with the deck by a companionway on the starboard side,

and another companionway aft leads to a passage connecting with five guest's staterooms, a toilet room and a bath room.

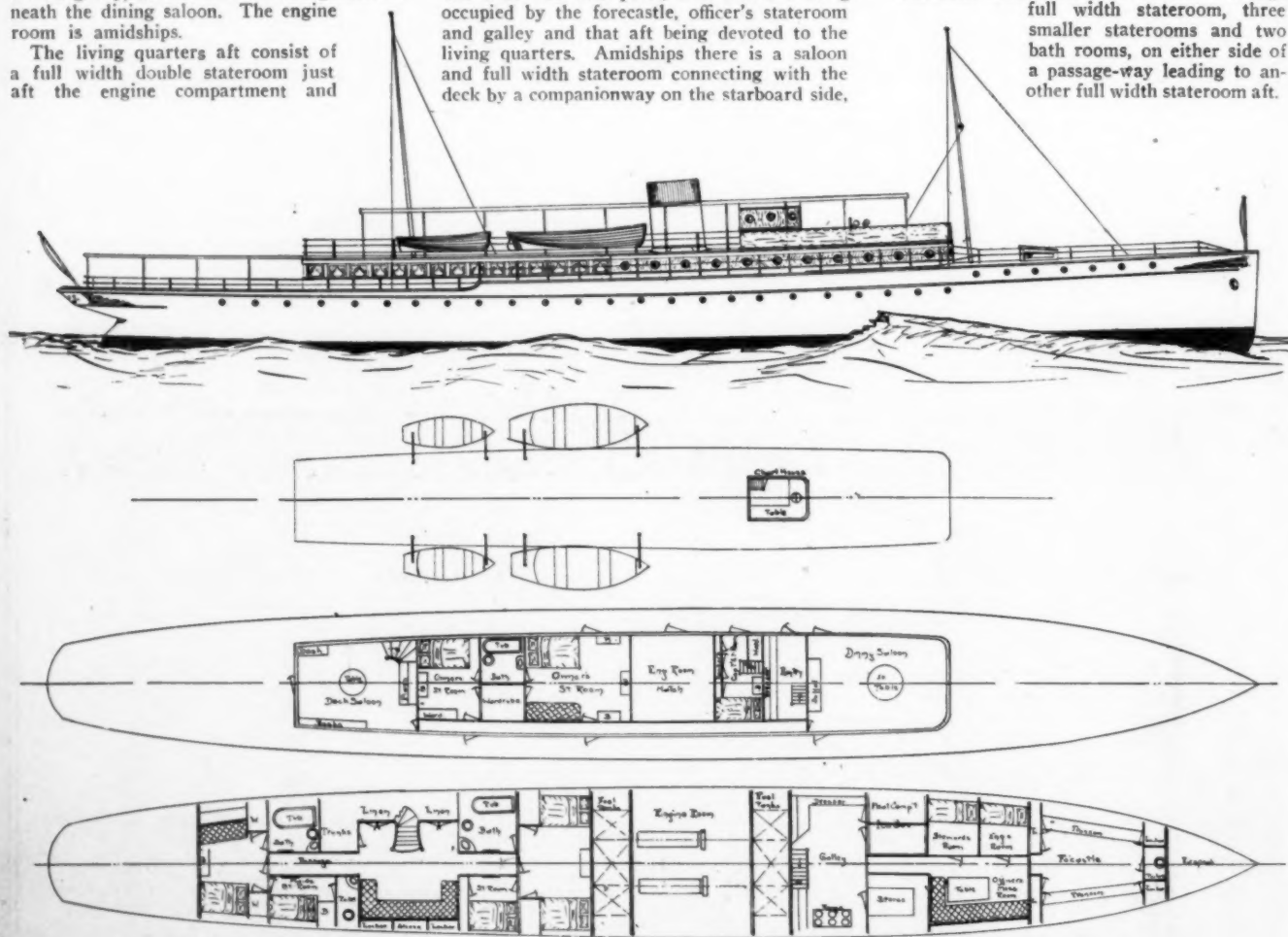
A Luders 123-Footer.

THE design at the bottom of the page opposite is a new one from the Luders Marine Construction Company, of Port Chester, N. Y., and her principal dimensions are as follows: Length on deck 123 feet, water line length 119 ft., beam 20 ft., draft 5 ft. 6 in.

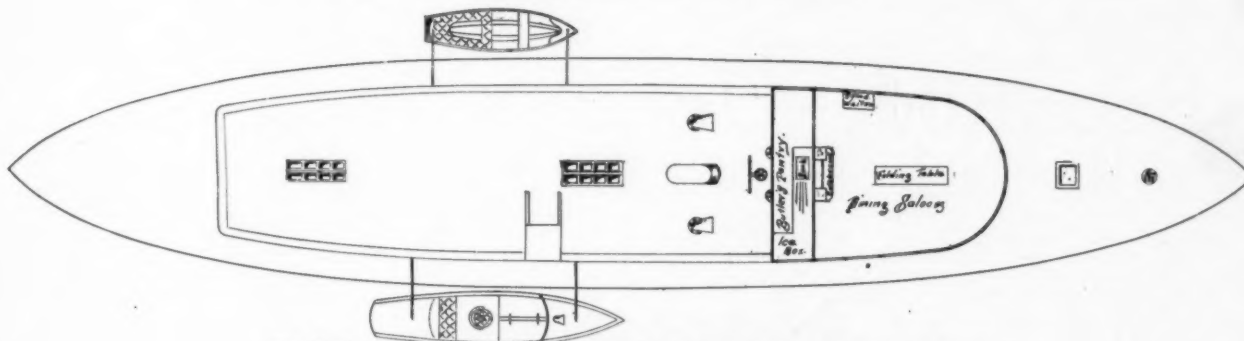
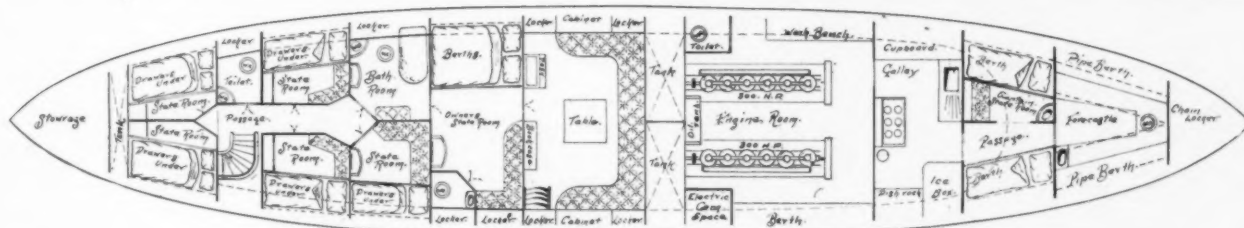
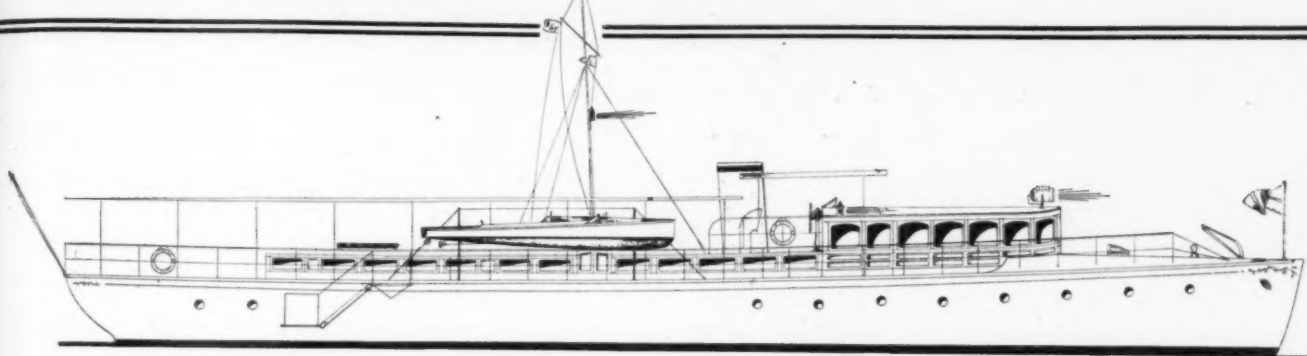
The boat was laid out for a triple power installation. The forward deck house is divided into a music room forward and a wireless room in the after end between which are a toilet room and companionway, and a second deck house is devoted to the dining saloon and galley.

The accommodation below deck is divided by the engine room into two divisions. The forecabin accommodating eight men, the captain's and engineer's stateroom and the mess room occupy the space beneath the forward deck. A full width stateroom is next aft and a smaller stateroom and toilet room occupy equal spaces at either side of the companionway to the deck house.

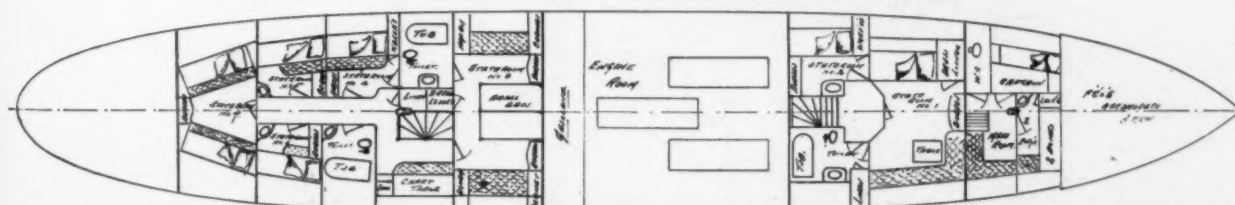
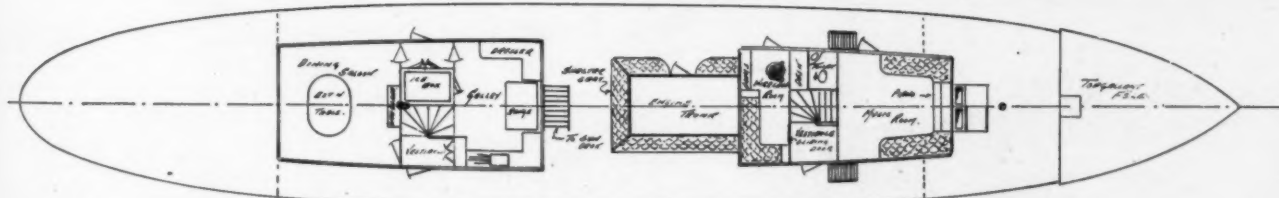
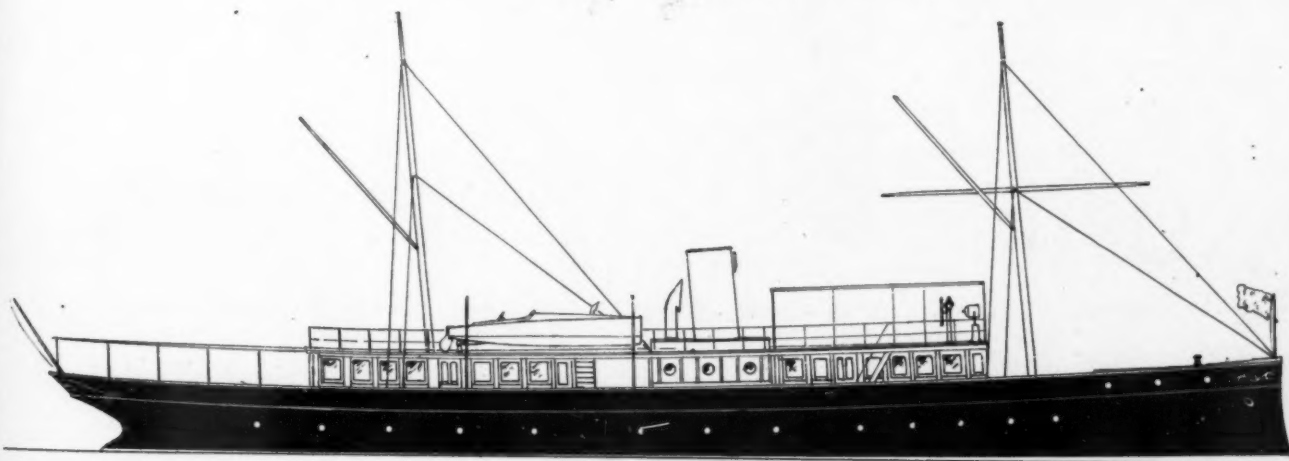
The after accommodations consist of a large full width stateroom, three smaller staterooms and two bath rooms, on either side of a passage-way leading to another full width stateroom aft.



The 160-footer designed by Messrs. Whittelsey & Whittelsey marks about the present limit of practicability.



The Reliance, 98-footer, equipped with 600 h. p. would do 20 miles an hour.



The Luders, 123-footer, was designed for triple power installation. Note the interesting arrangement of the deck houses.

British International Developments

The British Motor Boat Club and the Royal Motor Yacht Club Both Send Challenges for Trophy.
Descriptions of the Boats Already Certain to Enter the Elimination Trials for America.

FOLLOWING closely upon the publication of the new rules for the British International Trophy Race which appeared in the last issue of *MoToR BoatinG*, two challenges were received by the Motor Boat Club of America, showing that the British are as gamely determined as ever to wrest the blue ribbon of the motor boat world from America. One of these challenges was received from the Royal Motor Yacht Club and the other from the British Motor Boat Club, and a description of one of the challengers has already reached us. She is a 40 foot Thorncroft hydroplane building for Mr. Mackay Edgar, by Messrs. Dixon Brothers and Hutchinson, and is an enlarged edition of the famous *Miranda IV*. One of the motors of the ill-fated *Maple Leaf* will be reconstructed and installed with a similar one now under construction. As far as the other

boat is concerned, we can only guess that it will be a hydroplane of the Fauber type.

The eye-opener that we received at Larchmont last August and the withdrawal of Dixie have had the desired effect and there are already it is said twice as many defenders under construction as can be entered to represent the country. Mr. Albert E. Smith, one of the Board of Governors of the Motor Boat Club of America, has commissioned Henry R. Sutphen, of the Electric Launch Company, to build what has been termed an Elco-Plane, the result of numerous experiments in the model basin of the Navy Yard at Washington, D. C. She will be equipped with two 300 horsepower, six cylinder, air starting and reversing Standard motors of a special design which are being built under the supervision of Mr. Riotte of the Standard Motor Construction Company.

Clinton H. Crane, the father of Dixie, has designed a monoplane for a syndicate composed of Commodore H. H. Melville, Vice-Commodore F. K. Burnham, the owner of Dixie, and August Heckscher, all of the Motor Boat Club of America, and the new boat will be equipped with Dixie's motor and a similar one now under construction by H. M. Crane.

It is said that a boat of the Fauber type is also under construction at the Electric Launch Company's yard for J. Stuart Blackton, and it is reasonably certain that R. G. E., the Rice Gas Engine Company's 40 footer which was not finished in time for last year's race, will be entered in the elimination trials.

We have just received word that E. H. Simmonds, of Lake Geneva, Ill., is building a 32-foot Fauber hydroplane for Com. J. A. Pugh, of the Pistakee Yacht Club. She will be equipped with three 150 horse Emersons.

Brunhilde-Ursula's Successor.

THAT progressive sportsman, the Duke of Westminster, not satisfied with the remarkable showing of *Ursula* in last year's Monaco meeting, when she made her wonderful record of 43.6 miles per hour, or with the chances of *Pioneer* to beat even this figure, has had constructed a new hydroplane of the Fauber type which is shown in the illustrations below and which will be known as *Brunhilde*.

Brunhilde has the Fauber underbody with which we became so well acquainted last year but her upper body has a refinement utterly lacking in *Pioneer*. With her flare forward and tumble home aft she has somewhat the appearance of her predecessor, *Ursula*, and is

infinitely more pleasing than the vertical sided *Pioneer*. Her power plant will be the same as that used in *Ursula*, one of whose engines was installed in *Pioneer*, and therefore with an addition of 10 feet in over-all length she will have double the power of *Pioneer* and

doubtless will lower the Monaco record.

Intended for the unlimited class, the new boat is 49 ft. 8 in. over all, with 8 ft. 6 in. beam, an unfortunate fact that precludes all possibility of her visiting America, as the limit for the British International is 40 ft. She was designed and built by Messrs. Saunders and is of the six-step Fauber type, with somewhat finer lines than *Pioneer*, although of greater beam. The hull is built of three skins of mahogany sewed together in the well-known Saunders fashion. The outer planks, coamings and covering boards are all in one length, and the mahogany engine bearers, three in number, are of great depth, the middle one running from stem to stern.



Brunhilde, the successor of *Ursula*, a 50-foot six-step hydroplane of the Fauber type, built for the Duke of Westminster. See page 7.



Among the Clubs

A fleet of motor boats at the house of the Georgetown University Boat Club.

Illinois Valley Yacht Club, Peoria, Ill. A recent announcement states that this club is to be the patron of the Third Annual Regatta of the Western Power Boat Association, the dates set being August 8 and 9. The program and prizes, as laid out, are as follows: 40 ft. class, 20 miles—\$750 first, \$100 second; 40 ft. class, National Hotel sterling silver cup—\$250; 32 ft. class, 15 miles—\$100 first, \$50 second; 26 ft. class, Hotel Fey sterling silver cup, \$250; 26 ft. class, 10 miles, \$100 first, \$50 second; 20 ft. class, 10 miles—\$350 first, \$100 second; 20 ft. class, Hotel Lud sterling silver cup. The rules of the races as laid out are few and simple. Boats of a lower class may enter a higher class; two boats must start to constitute a race, and no second money will be given if there are less than three starters. The entries close August 5th, the regatta being open to members of any yacht club. Chairman Thomas H. Webb, of the Racing Committee, announces that there will be seen at Peoria this season, which, by the way, has come to be styled "The Monaco of North America," aside from the record-breaking craft of James A. Pugh and Carl G. Fisher, a 32-foot hydroplane designed by Morris M. Whittaker and which is being built for moving picture races and which will be equipped with a pair of Pierce-Budd 400 h.p. motors. In addition to these are two St. Louis speed boats and a new 32-foot hydroplane belonging to Mr. Pugh and which will be raced by Victor K. Emerson, builder of the motors with which the craft is equipped. The hydroplane will carry three Emerson motors of the same type as those installed in "Emerson," which won many races in the east last season and it is expected that she will come very close to the world's speed record for water craft.

Hampton Roads Yacht Club, Norfolk, Va. This club, at a meeting held recently at the Lynnhaven Hotel, voted unanimously to reduce the number of active members from 300 to 200. The meeting was largely attended and all present were enthusiastic over the proposed change. Commodore Dodson gave as a reason for this action that the stock of the club had been cheapened by a large number of stockholders who took no interest in the workings of the club, and who would sell their stock to the first man who was willing to buy. Plans were discussed in regard to summer racing, and the ordering of design boats for that purpose. It is proposed to hold races two or three times a month during the season, and three prizes will be given to the winners.

Excelsior Yacht Club, Brooklyn, N. Y. The annual meeting and election of officers of this club was held recently. The club was organized in 1889 and boasts over 100 members. The officers elected to serve for 1911

are: Commodore, A. J. Joa; vice commodore, A. Hewitt; rear commodore, W. A. Cornell; financial secretary, C. D. Olmstead; recording secretary, W. A. Winterbottom; treasurer, A. Beyer; measurer, E. J. Holzman; fleet captain, C. E. Radick; fleet surgeon, Ed. DeVos; fleet chaplain, E. Ronalter.

Brooklyn Yacht Club, Bensonhurst, New York. More than one hundred and fifty members of this, the second oldest organization of its kind in the country, gathered in the east ball room of the Hotel Astor recently at the fifty-fifth annual banquet, and pledged themselves to make the administration of Commodore William Randolph Hearst the most successful in the history of the organization. Notable in the gathering were commodores from five other yacht clubs, whose colors are seen in and about the harbors of New York. It was a representative gathering of men, active in promoting one of the cleanest and most healthful sports. Commodore Hearst in his speech evoked enthusiastic applause when he proposed a Reciprocity race on the seas between New York City and Halifax, N. S., offering to donate a trophy for the winner. It was announced that the club season will open about Decoration Day, when the activities, described in last month's issue, will be commenced.

Motor Boat Club of America. Announcement was made recently by the secretary of the club, shortly after he had received through the mails the formal challenges of the Royal Motor Yacht Club of England and the British Motor Boat Club, that the next holder of the British International Motor Boat Trophy, now held in America, will be decided by races in Huntington Harbor, Long Island, on August 24, 25, 26. Acceptances of the challenges have been forwarded to England. It is expected that not less than three boats will be built here to defend the trophy won last summer by Dixie III. At least two fast craft, one of them possibly a new boat built by the Duke of Westminster, are expected to be sent here to compete for the international honor.

The New York Motor Boat Club, New York City. The dates for this club's annual race to Albany and return were set at a recent meeting of the committee. The start will be made at six o'clock on the evening of July 1. The race is open to all motor craft, except automobile boats, under 40 feet over all length, and enrolled in any recognized club. Cruisers and open boats will be rated in their respective classes under the 1910 American Power Boat Association rules. Entries close on June 28th. In 1909 the race was won by Martha, owned by Paul Kessek, and in 1910, by Elmo II, owned by F. D. Giles, Jr. New boats are building with the

Albany contest in view, and officials of the New York Motor Boat club expect that with good weather a new record will be established.

Dubuque Boat Club, Dubuque, Ia. In accordance with a report this club is making extensive preparations to handle the M. V. P. B. A. regatta in July, most of the preliminary details having been disposed of. The value of the prizes will be between \$5,000 and \$6,000. It is said that the citizens in general are back of the boat club and every effort will be made to make the regatta the biggest event in Dubuque's history.

Farragut Sportsmen's Association, Camden, N. J. Although the charter of this association has been but recently closed, the club is fast becoming an important factor among organizations of its kind in this part of the country. The feature of the organization is, that it is interested in various sports, its membership comprising some of the best-known sail- and power-boat men, marksmen, canoeists and swimmers in this section of the state. The recent election resulted as follows: President, Charles Elmer Smith; commodore, S. H. Wharton; captain, Walter Law; recording secretary, Frederick Von Nieda; financial secretary, Harold A. Renner; treasurer, S. P. Hallowell.

Great Lakes Power Boat League, Buffalo, N. Y. Plans for the First Annual Reliability Cruise Contest, including the contest for the Scripps Cruise Trophy, were laid at a recent meeting of the Rules Committee held at Buffalo, N. Y. The object of the cruise is to foster a better acquaintance among power boat men along the Great Lakes, and to encourage a high standard of boat building and of the manufacture of engines and accessories. The cruise this year will be from Detroit to Buffalo and return. Night controls will be established at intermediate ports, and it is estimated that each day's run will average about 75 miles. Full details of the conditions of the contest, which is in no sense to be considered as a race, will be announced within the next 30 days. It is anticipated that these annual cruises will become as popular and widely known among motor boatmen as is the famous Glidden Tour among motorists.

Westville Power Boat Association, Westville, N. J. The annual election of officers for the 1911 season took place recently with the following result: Commodore, Charles Hassenforder; vice-commodore, A. Egolf; rear-commodore, D. W. Humphreys; secretary, J. T. O'Brien; treasurer, G. C. Ade. Several new boats are to be added to the fleet this season, notably a 24-foot racer, designed and owned by Capt. Gustave Muller.

This boat is to be powered with a light aeroplane motor, of 30 horsepower and six cylinders, of Lloyd design. This boat will be entered in the local races, and it is expected that she will prove very fast. Plans have been selected for the club's new house, and it is hoped to dedicate it on the official opening day, May 30th.

Royal Vancouver Yacht Club, Vancouver, B. C. Affiliation with the Pacific International Power Boat Association was decided upon by the members of this club at the annual meeting held at the Board of Trade rooms recently. Many of the members are connected with the Power Boat Association individually, but, officially, the club has never been associated with the power organization. The latter has charge of the annual long distance power boat races, which will start at Vancouver this year.

Robbins Reef Yacht Club, Bayonne, N. J. At a recent meeting of this club the following officers were elected for the season of 1911: Commodore, F. J. Mueller; vice commodore, J. Crowley; rear commodore, A. M. Probst; treasurer, Val. Steinmetz; recording secretary, Fred Golding; financial secretary, C. O. Stalling; measurer, S. Fowler; fleet surgeon, Dr. Stevens. Vice-Commodore Probst, upon the event of his election, presented the club with a \$25 cup, to be sailed for during the coming season, the conditions being that the cup must be won by the same boat on two different occasions.

Bay Ridge Yacht Club, Brooklyn, N. Y. The election and installation of officers took place in the club rooms at the foot of 58th Street, Brooklyn, recently and the following officers were elected: Commodore, C. W. Cooper; vice-commodore, G. W. Hall; rear commodore, H. J. Joa; secretary, Henry Lehman; treasurer, Elmo Hoagland. Although in its infancy the club has a membership of 114, a fine fleet of boats and a hustling set of officers who strive to keep the members interested at all times.

Pensacola Yacht and Motor Boat Club, Pensacola, Fla. At an enthusiastic meeting of this club held recently in the rooms of the Chamber of Commerce, officers were elected and a proposition was accepted for the erection of a handsome new clubhouse. The proposition was from Walker Gonzalez, who has a suitable site on the bayshore, near Sullivan's wharf. The board of directors is to meet soon and make the final arrangements with Mr. Gonzalez for the erection of the building. The officers elected were as follows: Commodore, Thos. C. Watson; vice commodore, N. J. Lillard; rear commodore,

P. Lindenstruth; secretary, R. B. Hargis; treasurer, W. K. Hyer, Jr.; fleet captain, R. B. King.

Maryland Motor Boat Club, Baltimore, Md. At the second annual meeting of the club held recently at the Eutaw House, all of the officers were re-elected and but one change was made in the board of governors. The several committee reports showed the club to have had a very successful year. The officers re-elected were: President, Meyer Rosenbush; vice president, H. Wirt Steele; commodore, William P. Bigelow; vice commodore, W. W. Varney; rear commodore, Albert H. Likes; fleet captain, Ambrose Vogt; secretary, Charles C. Counselman; treasurer, Edward A. Weller.

Oshkosh Power Boat Club, Oshkosh, Wis. On a motion to suspend the rules, made at a recent meeting of this club the entire list of officers was re-elected for the 1911 season. The matter of holding more races on the Fox River and on Lake Butte Des Morts and on Lake Winnebago, in 1911, was talked of, and the sentiment was strongly in favor of the general Club Cruises such were held in 1910. The Fox and Wolf rivers and their tributary lakes offer hundreds of miles of ideal power boat waterways, with picturesque scenery and charming cities to visit at almost any distance from Oshkosh. The matter of forming a coalition of the Oshkosh Automobile Club with the Power Boat Club was broached at the meeting, both clubs to use the present clubhouse of the Boat Club. This clubhouse is beautifully situated on a rise of land commanding the entrance of Fox River into Lake Butte Des Morts, eight miles northwest of the city of Oshkosh. The club has spent much on the improvement of this house and plans to work further changes for the better during the coming season.

East Greenwich Yacht Club, East Greenwich, R. I. This club recently elected the following officers: Commodore, Melville A. Newcomb; vice commodore, T. Drew Dunne; secretary, F. S. Nock; treasurer, Louis W. Dugdale. The commodore has appointed Captain W. L. Sharpe, fleet captain, and Dr. George B. Langmaid, fleet surgeon. Considering the fact that the club is practically a new one, it is noticeable that there are already 123 members, and some 48 yachts enrolled. The location of the club in East Greenwich, R. I., is an ideal spot, the harbor being of the finest. It is entirely land-locked and there is excellent anchorage for boats of considerable draught.

Lakewood Boat Club, Lakewood, O. The annual meeting of this club was held recently

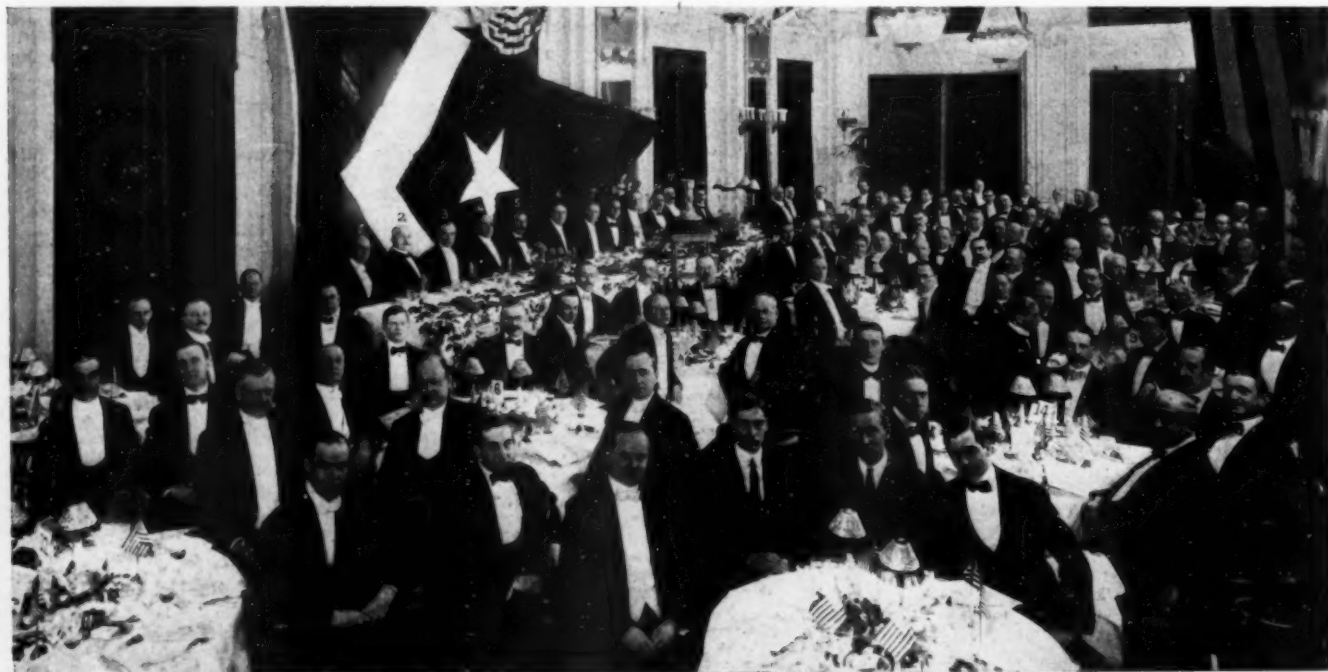
at the Detroit Ave. Hotel. The election of officers was held and the staff remains the same with the exception of the vice-commodore and recording secretary. The officers are as follows: Commodore, Otto Hlavacek; vice commodore, G. H. Hutcherson; financial secretary, E. E. Burgner; treasurer, L. W. Theis; recording secretary, A. G. Linden; financial secretary, E. E. Burgner. The termination of the annual meeting was brought about by a banquet held in the dining room of the hotel.

Maumee River Yacht Club, Toledo, O. Work on the new club house at Walbridge Park is progressing rapidly, and it is expected that the new home of the club will be ready for an official house warming within a short time. As a testimonial to the hustling qualities of Commodore Percy Jones, he was presented with a red and white pennant at a recent meeting on which are the letters G. T. M., which, being translated, mean "Get the money."

City Island Yacht Club, City Island, N. Y. The first annual reception of this club held recently at Majestic Hall, 125 East 125th St., New York City, is reported a complete success both financially and socially. About three hundred guests were present, and the committees carried the affair through without a hitch.

Corinthian Yacht Club of Yale, New Haven, Conn. At a recent meeting of this club officers were elected for the 1911 season, as follows: Commodore, Leslie Soule, Dorchester Centre, Mass.; vice commodore, James Wallace Paramore, St. Louis; rear commodore, Cavour Hartley, Duluth, Minn.; fleet captain, Herman Rutgers Emmet, New Rochelle; treasurer, August E. Cordier, Woodhaven, N. Y.; secretary, John Coleman, Louisville. An attempt will be made to arrange races with Harvard.

Beach Terrace Yacht Club of Bristol, Providence, R. I. This club was incorporated recently by Bristol and Providence yachtsmen, and officers will soon be elected, a regatta committee appointed, and dates set for aquatic events for the club during the coming season. The club has new headquarters in a homelike cottage with a wide veranda overlooking the waters of Naragansett Bay. The structure, which was completed last fall, is in the high-land summer section of Bristol, and there is a distance of only 100 feet between the big bluff on which the building rests and the waters of Warwick Bay. A reception room has been fitted up on the lower floor, where there are also lockers and places for cooking and serving luncheon.



The fifty-fifth annual banquet of the Brooklyn Yacht Club.

At the speaker's table—William Gardner, Naval Architect (1); Com. Ralph Croft, Audubon Y. C. (2); Com. H. H. Melville, Motor Boat Club of America (3); W. H. Barnard, Atlantic Y. C. (4); Vice Com. A. C. Soper, Brooklyn Y. C. (5); Com. W. R. Hearst, Brooklyn Y. C. (6); Rear Com. C. V. Dykeman, Brooklyn Y. C. (7); Com. Le Sauvage, Bensonhurst Y. C. (8); Com. C. S. Welch, Colonial Y. C. (9); Com. George Emmer, Jamaica Bay Y. C. (10); F. H. Graf (11); Thomas Fleming Day (12).

New Things for Motor Boatmen.

New Attachments and Accessories That Are Offered to the Man With a Boat.
The Month's Production of Devices Designed as Aids to Motor Boating.

[Under this heading will appear each month descriptions and, whenever possible, illustrations of the various devices designed to add to the pleasure and comfort of motor boating which have been brought out since the previous issue. It should be kept in mind that the department in any one issue is, as it were, only one month's instalment of the many useful things on the market, and that it will be well to consult the previous issues of MOTOR BOATING which will form, together, a very complete illustrated directory of the things the motor boatman needs. —In writing the makers of the articles shown, if our readers will mention MOTOR BOATING they will receive special attention.]

Convertible Ratchet Wrench.

A novel and most useful form of wrench is being manufactured by the Convertible Ratchet Wrench Co., of Allentown, Pa., with a branch office at 1,777 Broadway, New York City. This is said to be the only wrench which can be used in 32 different positions, the illustration showing clearly the method of operation. The ratchet feature is a novelty in this form of tool and the wrench can be easily operated in the most inaccessible places about a motor, taking the place of a set of straight wrenches as well as "S" wrenches. They are sold in 8 inch size for \$2.50 each.

Durkee Seaproof Switch.

A boat switch which is said to be absolutely waterproof has been placed upon the market by C. D. Durkee & Co., 2 and 3 South St., New York City. All the contacts and switching mechanism of this device are sealed within a water-tight base, access to the interior of which is unnecessary in making wire connection. These connections are made by means of removable plugs through which the wires are inserted and which screw into the switch contacts. No binding nuts are employed which are liable to jar or work loose and since all contacts are sealed within the base they cannot be affected by salt water or atmospheric conditions which would ordinarily corrode them. The seaproof switch has wiping contacts throughout, thus insuring bright, clean surfaces. It is wired for battery and magneto and the price is \$1.40.

Minimax Fire Extinguisher.

An extinguisher in a compact cylindrical form made especially for motor boats where space is valuable is being manufactured by the Minimax Company, 198 West Broadway, New York City. This form possesses all the merits of the Standard Minimax type which is made in cone shape, and in addition it is fitted with a movable nozzle which allows an absolute control of the jet so that the stream can be played in any direction, reduced to a

spray, or shut off entirely if desired. The chemicals are contained in hermetically sealed receptacles, and are not affected by atmospheric conditions, so they may be relied upon to do their work at any time. Periodical re-filling is unnecessary and the up-keep is very economical. A leatheroid case is provided if desired so that the extinguisher may be carried in any part of the boat.

"Midget" Class One Lights.

The Porter Co., 194 Water St., New York, manufacturers of marine lights, are making a special offer of \$5.00 per set on their "Midget" brass lights. These lights will not blow out, give a remarkably bright light and have extra large oil pots. At a slight extra charge, they can be fitted for electric and oil or electric only. They are of handsome shape, have no springs to come loose, are made the smallest practical size and being made of brass will last many times longer than galvanized iron lights. The stern light shown herewith is also a first class anchor light and deck or hand lantern. A set boxed weighs but five pounds.

Sands Marine Air Pump.

The A. B. Sands & Son Co., of 22-24 Vesey St., New York City, manufacturers for over 60 years of high grade marine sanitary fixtures and specialties, have this season added to their line several sanitary fixtures and other appliances designed to increase the comfort, safety and convenience of yachtmen and motor boat enthusiasts. Chief among these is the new style "Auto Force Marine Air Pump," shown below. This is a patented article which the above concern have obtained the exclusive right to manufacture for marine use, and which acts as a powerful pumping ventilator for removing the foul air from all confined spaces, such as engine rooms, galleys, toilets, and forecabinets. It is especially efficient in removing gasoline fumes from engine rooms and pits, thereby reducing the liability of explosions and taking away the offensive odor of burned gas. This air pump is made in polished brass and copper, also galvanized iron, and is fitted with a canvas tube,

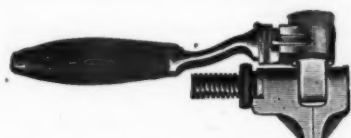
re-inforced inside by a spiral coil to give rigidity, and extending to the cabin or hold.

Marvel Solder.

A new type of solder has been placed upon the market by the Mutual Auto Accessories Company, of 1,937 Broadway, New York City, which is extremely simple and convenient to use. The only precaution necessary in applying it is to see that the surface is free from oil or grease. A sufficient amount of the solder to cover the part to be repaired is squeezed from the tube and spread on with the fingers. The material will harden in about 15 minutes but it can be immediately subjected to any amount of heat if desired. Marvel solder will harden equally as well in steam or in hot or cold water and will withstand a great amount of pressure.

A New Auto Steerer.

The illustration below shows a new steering wheel with controls which has recently been designed by the Bath Marine Construction Company, of Bath, Maine, and which was exhibited at the Boston show. In this new device, the designers have met all the advantages of ordinary wheels, since it is handsome enough for the finest boat, and at the same time at a price which is little advanced over the common side steerer. The steering column is built up of heavy brass tubing, with brass web and laminated mahogany rim 14 inches in diameter and is attached to the bulkhead by means of a brass flange, the whole highly polished. The column has a good rake aft, and is 22 inches long, which brings the wheel to a comfortable position for the steersman. The barrel type has been adopted so that it may be placed at one side if desired, a feature which is impossible with a rack and pinion gear, as the rack strikes against the sides of the boat. A brass finger projects under the barrel to prevent the rope from falling off, should it become loose. The spark and throttle controls are led up inside the steering column with levers which work on a quadrant right at the finger tips, and are on the left hand side so that the right hand is free to operate the wheel or reverse lever, or by loosening a nut they may be swung to



The Convertible Ratchet Wrench.



The Durkee Seaproof Switch.



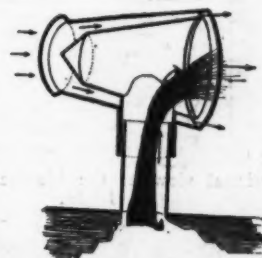
Minimax Fire Extinguisher with leatheroid case.



The Bath Marine Auto Steerer.



Combination port and starboard light of Class 1.



The Sands Marine Air Pump.



The Porter Stern Light.

the other hand if desired. The controls extend through the bulkhead and are connected by levers to the timer and throttle on the engine.

Marine Compass Light.

To overcome the fault common to ordinary compasses fitted in a binnacle, a new form of compass light has been devised by the Marine Compass Co., of Bryantville, Mass. When the light is thrown from above or from the side the rays cause a wide field of light with reflections which interfere with the sight. This new device is known as the "Perfect" Light Attachment and practically obviates the necessity of a binnacle head except for protection when exposed to the weather. It provides also a means for illumination of the compass card by reflection on the points immediately under the eyes of the helmsman and since the reflector throws light upon that portion of the card to be read it also acts as a shield to the sight. A detachable bottom to the compass bowl permits removal when desired. The distinctive feature of this light is the equalized diffusion upon the points. The illustration shows how the reflector shades the eyes as well as concentrates the light upon the point to be read. The lights can be operated from two or three cells at a total cost of about one cent per hour. These liquid compasses complete with lights sell for from \$21 to \$25 according to the size.

Sands Two-Tone Horn.

This motor boat signal is manufactured by the A. B. Sands & Son Co., of 22 Vesey St., New York City, and is known as the Sands Motor Boat Signal Two-Tone Horn. It is made in highly polished brass and nickel plated, and measures 10 3/4 inches in length. Style "A" has rings for fastening a cord, while style "B" is arranged with bracket for screwing to deck or elsewhere, and is blown through a special removable extension tube. This horn lists at \$2.25, and the special rubber tube with fittings at 75 cents. This horn is a high-grade article and fulfills the requirements of a signal device for small boats.

Connecticut Magneto.

The Connecticut Telephone & Electric Co., of Meriden, Conn., makers of the Connecticut spark coils, have placed on the market for 1911 several new types of high tension magnetos which were exhibited for the first time at the New York and Chicago Automobile shows. Types A-4 and A-6 dual type can be arranged with no coil on the bulkhead. The secondary or transformer winding is enclosed in cartridge form which screws flush into the bow of the magnets so that it

can be removed or replaced by a new one just as easily as a unit in the spark coil. The dual system is also furnished with a powerful starting vibrator, which produces a shower of sparks in the cylinder by pushing the starting button on the switch. The magneto is entirely enclosed, and is equipped with tell-tale spark gap windows through which missing of any one plug may be instantly ascertained. A special claim is made for slow speed performance of this magneto; it will fire on the slowest possible engine speed and start on one-quarter turn of the starting crank. This system is of the simplest design, no high tension wires being necessary outside of those running regularly to the plugs.

Jones Tachometer.

The New York Sporting Goods Co., 15-17 Warren St., New York City, are handling a new instrument known as the Jones Tachometer. It is designed to take the place of the automatic log used by ocean-going vessels. This device has proved to be a most useful part of the equipment of any motor boat since it shows the dead reckoning at all times and constantly indicates the engine's speed in revolutions per minute. This tachometer may be placed in the engine room or on the bridge or in any other part of the boat desired and is particularly useful on twin-screw boats where it is desirable to have both engines running at the same rate of speed. The instrument is built by the same company as the well known Jones speedometer and sells for \$30 complete, with a five-foot shaft and gear fittings.

Breech Block Plug.

A. R. Mosler & Co., 163 West 20th St., New York City, have purchased the rights for the Breech Block Plug which is, by reason of its construction, of the "Spit-Fire" type, since it has the closed end and side cleaning holes. A cap on the end of the hood prevents oil from splashing on the insulator, and the side cleaning holes allow the gases which have been compressed on the up-stroke of the piston to become heated before the spark occurs. The Spit-Fire construction allows the insulator to be removed instantly, changing the plug to a relief or priming cock as desired, or permitting a plug to be changed while the motor is running. One pull and a push is all that is necessary to change a plug, without the use of tools. It is made in either mica or porcelain and can be procured with genuine platinum or iridium points if desired. The Mosler timer which is also made by this concern, though apparently at first sight not

as advantageous as others because of its fiber construction, is nevertheless much more reliable on account of the larger insulating surface between the contact points and the ground. It has a self-locating ball-bearing roller and a ball-bearing self-adjusting centering clutch.

Cutler's Planking and Decking Clamp.

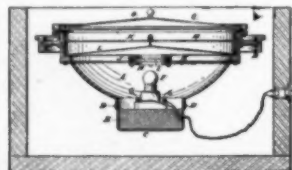
This clamp is made in two sizes and is designed to permit the hull or deck planking to be wedged instantly into position in boat-building for fastening. It does not interfere with any of the work and does not deface timbers or planking in any way. The instrument is made of malleable iron and is practically indestructible. The illustration shows the clamp in position for wedging up plank. The use of this clamp eliminates entirely all shoring and temporary nailing. The smaller size, adapted for light planking on speed boats from one-half to one inch square, sells for \$3 per dozen, and the large size, adapted to timbers from seven-eighths to two inches, sells for \$4 per dozen. The New York agent for this device is Frank A. Olmsted, Third Ave. and 139th St.

ImpervO.

ImpervO, which is manufactured by E. A. Armstrong, of 209 West Kinzie St., Chicago, is a waterproof clothing which is clean, light, and pleasant to wear, and will not stick or gum. It can be easily cleaned with soap and water and is grease and acid proof. This material is sold in sheets as well as in complete garments, and may be used as awnings, motor covers, etc. It is used in the U. S. Army to a considerable extent for shelter tents, etc., and is furnished in the following colors: Army olive drab, black silver grey, brown and yellow.

Drake Oils.

A number of grades of lubricating oil are being marketed by the Drake Oil Co., of Titusville, Pa., for motor boats fitted for various purposes. Speed-oil is made in four grades showing a gravity test of 31 1/2, known as "Light," a 30 1/2 gravity test known as "Medium," a 30 gravity test known as "Heavy," and a 32 1/2 gravity test known as "Special White." All carbon is completely filtered from these oils with the exception of the heavy grade and this contains but a very small percentage. These oils range in price by the barrel from 30c to 65c per gallon, the heavy grades being particularly adapted to motors for heavy duty work and the others for high speed boats and those having tight fitting pistons.



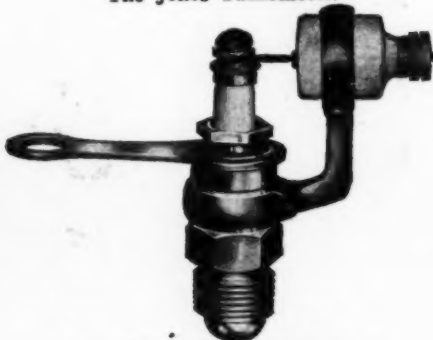
Sectional view of the Marine Compass Light.



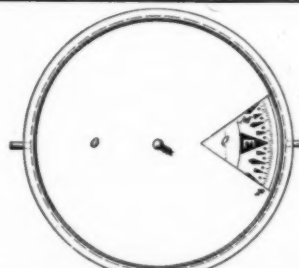
The new Connecticut Magneto.



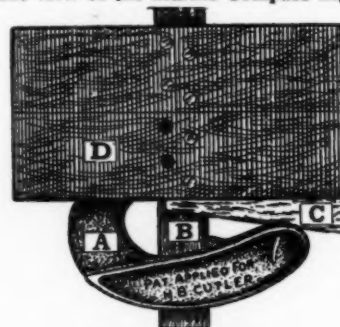
The Jones Tachometer.



The Mosler Breech Block Plug.



Face view of the Marine Compass Light.



The Cutler Clamp.

The Mosler Gasoline Filter.

The A. R. Mosler Company, of New York City, have recently perfected a little device whereby the gasoline is filtered as it leaves the tank, thus reaching the engine in as near perfect condition as is possible. This filter consists of a cylindrical tube having at its upper end a chamber through which the gasoline must pass before reaching the filter proper. The gasoline coming from the tank enters the little upper chamber and passes through a needle hole which, when the bottom of the filter is taken out for cleaning purposes, is automatically closed by a small steel ball. This ball is held away from the hole, and the hole kept open by means of a needle attached to the center of the drain opening which projects through the hole when the filter is closed and ready for business. The gasoline passes through the upper chamber into the lower where it goes from the inside chamber of the bottom cylinder, which is composed of a very fine wire mesh, to the outer chamber whence, near its top, leads the supply pipe of the carburetor.

Connecticut Steering Wheel Switch.

The Connecticut Telephone & Electric Co., of Meriden, Conn., makers of Connecticut ignition products, have just placed upon the market a new form of their steering wheel switch. This device is mounted in the center of the steering wheel and wire connections run through a tube in the steering column. This allows a perfect control of the battery and magneto circuits right under the thumb of the operator and in connection with the spark and gas levers. The first position of the switch is "off," the next position throws the coil or battery into operation, the second position throws the coil and battery together, sparking simultaneously in each of the cylinders; the third position throws the magneto only into circuit. Shooting the battery and magneto together in each of the cylinders slightly increases the engine power. The value of this switch will be recognized, however, in its control, particularly in connection with a magneto which ordinarily does not allow the car to throttle down slowly in crowded traffic. The coil and magneto can then be used together. This switch has been adopted by several well known cars for the 1911 season. The lever or handle of this switch is removable and therefore serves as a lock for the switch.

The Morgan Hose Coupling.

The hose clamp shown in the illustration below is of an improved type and is manufactured by B. Morgan, Cottage Street, New-

port, R. I. This type is known as type 10 and possesses the valuable feature of allowing adjustment so that it will fit any size hose. The flat brass band and buttress completely encircles the hose and is made from stamped brass with a brass nut and steel screw that cannot rust fast. The brass wing nut and finely threaded steel screw allow the clamp to be easily closed with a powerful grip and when desired as easily released without the use of tools. The clamp is made in five sizes, the smallest fitting any hose from $\frac{3}{4}$ to $1\frac{1}{2}$ inches over all diameter, selling at 10c, and the largest fitting a hose measuring from 3 to $3\frac{3}{4}$ inches and selling at 25c.

"E. Z." Quick Detachable Plug.

This plug is a recent product of the Auto Parts Mfg. Co., 56 Pine Street, New York, and possesses the valuable feature of being able to be opened, cleaned and closed again within a few seconds' time. Less than one-quarter of a turn opens the plug and releases the core with both terminals in a detached member. This insures an accurate adjustable spark gap and the instrument can be cleaned with one turn, and locked with a push of the finger, to withstand a pressure of 2,000 pounds. It gives a hot spark and cannot jar loose although no wrench is required to detach it. When the core is removed an excellent priming cup is formed by the outer shell. The complete plug is made in half-inch, metric or A. L. A. M. sizes and sells for \$1.25.

Sanborn Marine Speedometer.

This instrument is manufactured by the American Steam Gauge and Valve Mfg. Co., of Boston, and is particularly adapted for use upon motor boats, since it shows the actual speed attained in miles per hour rather than the revolutions of the propeller shaft. The cut below shows the method of making the outboard connections; the indicator itself shows a dial and a pointer very similar to an ordinary speedometer graduated in statute miles per hour, rating from 5 to 15 or 7 to 25. The instrument is operated by direct pressure of water which is obtained by the movement of the boat forcing the water through the tube projecting through the bottom of the boat as shown in the illustration. The triangular-shaped plate illustrated extends in front of the inlet tube so that sea-weed or floating

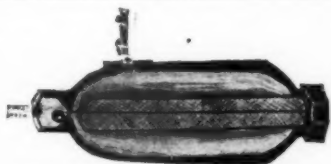
objects cannot enter. In addition to this feature a cleaning wire is provided having an adjustable handle which fixes it in position. Adjustments are quickly made and the whole device can be easily attached to a boat even while the boat is floating.

The Wyatt Engine Room Telegraph.

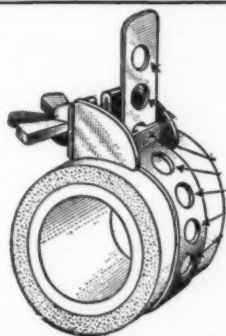
Heretofore, the cost of a signalling apparatus of the type shown has been more than most boat owners cared to pay, but this one has been designed with the idea of giving a reliable instrument at a price within the reach of all. The receiving station, as shown, consists of a polished bell metal gong with an aluminum hand which indicates to the man at the engine any order sent by the helmsman. The sending station is made entirely of polished brass and is connected with the receiving station in a simple and positive manner. An advantage of an engine room telegraph is that anyone can handle the engine or wheel without a knowledge of bell signals or the necessity of shouting orders that may be misunderstood. This particular machine is intended for cruisers or open boats, but several styles are manufactured for larger vessels. It is made by T. H. Wyatt, of Winthrop, Mass.

Marko Storage Battery With Meter.

One of the most recent improvements to this battery which is manufactured by Paul M. Marko, 102 Jefferson Ave., Brooklyn, N. Y., is the installation of a meter upon the top of the battery as shown in the accompanying illustration. It is a well known fact that almost any storage battery regardless of how good the quality can be seriously injured by attempting to use it repeatedly after its electrical energy has dropped below a certain point. By simply pressing the button near the motor the amount of current contained in the battery can be distinguished at any time, and in case of trouble the use of this meter will locate the fault, showing whether the difficulty lies in the wiring or whether the battery needs recharging. So long as the meter registers six volts or above the battery is properly performing its duties, but when the pointer drops below this mark the battery should be recharged. The Marko Battery is equipped with a novel form of grid and any shedding or disintegration of the active material is avoided. The meter type of battery is made in six volt, 40 ampere hour capacity selling at \$20; 60 hour capacity selling at \$26, and 100 ampere hour capacity selling at \$32. Special sizes and shapes are made to order and any voltage and capacity up to 300 ampere hours can be furnished.



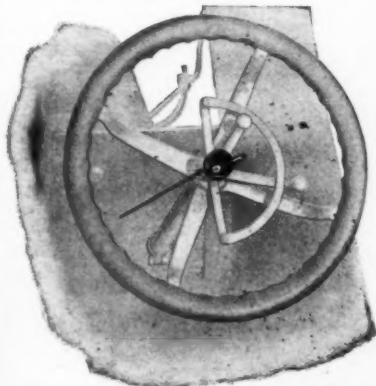
The Mosler Gasoline Filter.



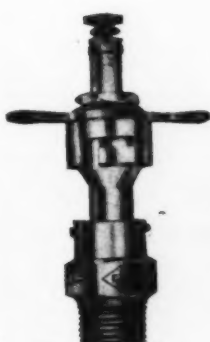
The Morgan Hose Coupling.



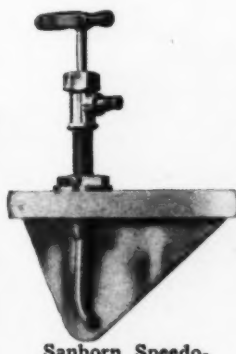
The Wyatt Engine Room Telegraph.



The Connecticut Steering Wheel Switch.



The E. Z. Plug.



Sanborn Speedometer.



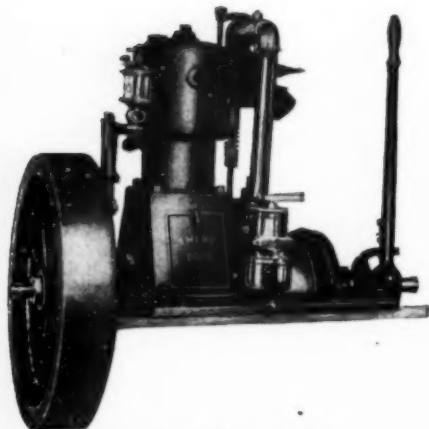
The Marko Storage Battery.

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Motors for Motor Boats.



The 4-Cycle Emery Motor.

The Emery Motor.

We show above one of the single cylinder type motors made by Emery Brothers, of Kennebunkport, Me. These are of the four-cycle type and being unusually small in size are particularly suited to a tender or canoe. They are fitted with complete salt water fittings and reverse gear. In the multi-cylinder motors the cylinders are cast separately and the pistons are equipped with three expansion rings and ground in on three sides. The lower crank case in cast in one piece and contains the reverse gear and stern shaft bearing. The inlet valve is automatic and the exhaust is operated mechanically by the half time shaft. The pump is of the plunger type driven by an eccentric from the main shaft and the oiling system is by gravity. The two and four cylinder motors are equipped with double ball contact timers and all the motors are furnished with the jump spark system of ignition.

The Reynolds Motor.

The Reynolds Motor Co., of 200 Hillger Ave., Detroit, are making a four-cycle motor which embodies in its construction not a single spring, cam shaft or push rod of any kind. The motor shown in the accompanying illustration develops 15-20 h.p. and has four cylinders measuring 3½ by 4½ inches, cast en bloc. This type of construction makes the motor very compact and permits the use of a short two bearing crank shaft. Both the shafts and the connecting rods are made from a special grade of drop forgings. The bushings are of bronze, lined with babbitt metal and the cases for the cranks and reverse gear as well as the cylinder heads, are covered with aluminum. The dual system of ignition is used, with a battery and coil for starting and the Eisemann magneto. In place of the ordinary spring valves used upon the usual type of four-cycle motors this engine is operated by a series of four disc valves, each of which has a single port and a stem projecting upward through the casting into the gear case. These valves are seated into the heads of the cylinders and as they rotate their ports register alternately with the intake and exhaust passages in the cylinder castings.



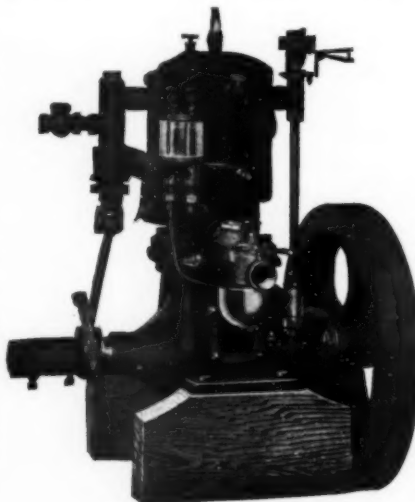
The Reynolds Rotary Valve Motor.

The Oriole Motor.

This motor is built by the Page Engineering Co., 113-121 East York Street, Baltimore, and is made in one, two and three-cylinder types developing 5, 7 and 8½ h.p.; 10, 14 and 17 h.p.; and 15 and 21 h.p., respectively. The motor is designed to turn at approximately 450 r.p.m. and does its best work with a propeller of large diameter and a corresponding pitch. The cooling water is discharged from the jacket into the exhaust fitting thus saving in the heat losses without sacrificing any of the cooling effect. This is due to the fact that the water is admitted to the cylinder directly over the exhaust ports where the most effective cooling is necessary. Extra large hand hole plates are fitted in each side of the crank case and the entire motor can be disassembled in a very short time. Exceptionally large bearings, crank pins and wrist pins are provided and while the motor is built particularly for heavy duty work there is no unnecessary material used in its construction and the parts are as few as possible in number.

Columbia Two-Cycle Motor.

This motor is manufactured by the Columbia Engine Co., of Detroit, in 2, 3, 4, 5-6, 7-8, and 8 h.p., single cylinder types; 9-10, 12, 15 and 20 h.p., two-cylinder types; and 20-25 and 40-50 h.p., four-cylinder types. All except the two latter models are two-cycle, and a heavy duty type is made in the 8 h.p. and 20 h.p.

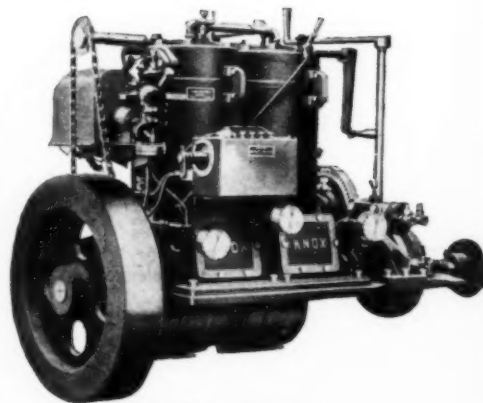


The Columbia Motor.

models. The cylinders are cast in one piece and are made of French grey iron with pistons made of the same material. The crank shaft is made from Vanadium steel and the connecting rod is of the I-beam section. The crank case is of the solid type and plastic white bronze is used in the bearings. A centrifugal oil ring is used to lubricate the connecting rod bearing and the cooling is accomplished by means of a reversible plunger pump. On all except the heavy duty types, the jump spark system of ignition is employed and the spark coil is of a special design fitted with a high speed vibrator. An expansion chamber is placed on the side of the cylinder and the exhaust gases pass into this before reaching the main exhaust pipe, thus largely eliminating back pressure. The Detroit Krice carburetor is used.

A New Knox Motor.

This motor was built by the Camden Anchor-Rockland Machine Co., of Camden, Me., to comply with the specifications called for in a contract by the United States government providing for a motor developing 15 h.p. at a speed of 550 r.p.m., on a continuous run of two hours. The engine has a bore of 5½ inches, a stroke of 6¼ inches and is a standard two-cycle type with a few changes made

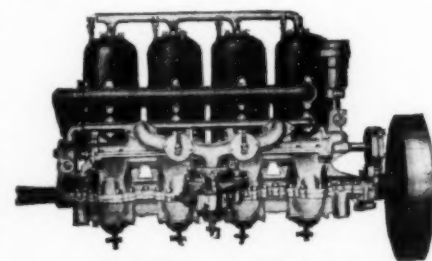


The New Knox.

to meet the government requirements. Water is by-passed from cylinder to cylinder head as shown in the cut, the oiler is mechanically operated and the motor is fitted with a gear-driven governor and a gear-driven Holtzer-Cabot magneto, both mounted on brackets attached to the engine at a height less than the height of the cylinder. An unusual feature for a two-cycle motor is the three gear driven pumps, one air, one bilge and one circulating, all of which can be seen in the illustration. The motor is fitted with a Knox self-contained reverse gear, a Hilton rear starter and has the reverse lever, throttle lever and spark control all grouped on the top of the cylinder.

The New Tuttle Two Cycle Motor.

The Tuttle Motor Co., of Canastota, N. Y., are putting out a new two-cycle motor which we show in the illustration below. This is the same motor which was shown at the New York Motor Boat Show and of which mention was made in the March issue of MoToR Boating. The motor is made in two sizes, the two cylinder developing 18-20 h.p. and the four-cylinder 36-40 h.p., not two and four horsepower as was stated previously. The intake valves of this motor are of the rotary type, mechanically operated, and give the motor the advantages of both the two and three port systems. The valve is driven at crank shaft speed by three spur gears. Double inlet ports are uncovered by the upper end of the piston upon its downward stroke and the compressed charge flows through the by-passes into the firing chamber where it is met by deflectors on the piston head and turned upward where the two currents meet at the top and form a whirling downward force, rapidly expelling the exhaust gases. Double exhaust ports are supplied on opposite sides of the cylinder midway between the inlet port. These make possible a very rapid scavenging of the cylinder. Lubricating oil is mixed with the gasoline in the ratio of one-half pint to five gallons of gasoline. The four-cylinder motor is provided with two three-way valves by means of which alternate pairs of cylinders may be relieved of their charge and allowed to run idle when full power is not required. The crank shaft is slightly off-set and a base bracket is provided for the installation of a high-tension magneto.



The New Tuttle 2-Cycle.

Yard and Shop



The basin of the New York Yacht, Launch and Engine Company at Morris Heights, New York City.

National Association of Engine and Boat Manufacturers.

At the annual meeting of this association, held at the Engineers' Club, in New York City, on March 2d, the report of the secretary, Ira Hand, showed the present membership to be 146, a net increase of 26 per cent. for the year. Henry R. Sutphen, chairman of the show committee, stated that the space rented to the exhibitors this year amounted to \$47,000, as against \$42,842 in 1910. The following members were elected to serve on the Executive Committee, class of 1913: James Craig, W. H. Mullins, E. A. Riette, C. L. Snyder, and Crispin Oglebay. The report of the attendance at the New York Motor Boat Show was presented as follows:

| | |
|-------------------------|------------------------|
| February 21..... 6,220 | February 28..... 7,699 |
| February 22..... 12,164 | March 1..... 7,793 |
| February 23..... 6,969 | March 2..... 8,329 |
| February 24..... 8,930 | March 3..... 10,552 |
| February 25..... 12,339 | March 4..... 10,661 |
| February 26..... 8,275 | |
| Total..... 99,931 | |

Marine Supplies Association of America.

This association held its third annual dinner at the Hotel Marie Antoinette, New York City, on February 23d, and more than 100 members and guests were present. The annual meeting was held before the dinner and the following officers were elected: President, William W. Wilcox; vice-president, Charles D. Durkee; treasurer, John Tiebout; secretary, Arthur Falk.

Electric Launch Company Discontinues Agency.

The Electric Launch Company, of Bayonne, N. J., designers and builders of Elco craft, have discontinued their agency in Chicago with James M. Wait & Co. All inquiries from this vicinity will hereafter be handled from the main office.

Branch Library in Ferro Building.

The Ferro Machine and Foundry Company, of Cleveland, have had installed in their new office building a branch of the Cleveland Public Library. A young lady is in charge of this branch all day and any book in the main public library can be obtained.

St. Louis Show Dates.

According to latest reports, dates for the St. Louis Motor Boat Show have been set for the week of April 24th. This show should be of great interest to all manufacturers, as it will cater to the motor boat enthusiast from along the Mississippi, Missouri, Illinois and Ohio Rivers. This show is to be run on a strictly co-operative basis and is held

for the sole benefit of the manufacturer anxious to increase his business, either direct or through dealers. The show will not be an annual event according to the present idea.

Fire Insurance Exchange Admits Pyrene.

The New York Fire Insurance Exchange has recently put into effect a resolution of its rating committee, one clause of which is as follows: "In rating risks of the following classes the same allowance will be made for Pyrene hand fire extinguishers as for other approved hand extinguishers." The classes mentioned

include many places where fire extinguishers are used.

Sterling Motors Win at Palm Beach.

An interesting feature in connection with the seventh annual regatta of the Palm Beach Power Boat Association held from March 14th to 17th, is the fact that out of twelve entries of boats equipped with Sterling motors, eleven won first prize. The only events in which Sterling motors were not represented were the consolation race and the race for boats making under 17 miles per hour.

Fairbanks-Morse Extensive Campaign.

According to the latest reports from the Fairbanks-Morse Company of Boston, they are carrying on an extensive advertising campaign. They are giving four private exhibitions, affording to motor boat enthusiasts in those vicinities where they will show, an opportunity to see the latest models of engines, boats and accessories. The display program, as laid out now, is as follows: Indianapolis, Ind., March 20-25; Cincinnati, Ohio, April 1-3-4; Cleveland, Ohio, April 8-10-11; and Louisville, Ky., April 15-22.

N. G. & G. E. T. A. Convention Dates.

President C. O. Hamilton, of the National Gas and Gasoline Engine Trades Association, announces the Hotel Pontchartrain as headquarters for the Detroit Convention, and June 20 to 23, as the dates. The Exhibition will be conducted somewhat along the same lines as was the Cincinnati meeting. There will be provided without cost tables in the adjoining rooms, where the manufacturers may have the opportunity of displaying ignition appliances and other accessories. The program will include special allotments of time for the examination of these displays.

Doehler Addition.

The Doehler Die Casting Company of Brooklyn, New York, are building a four-story concrete addition to their present factory, which will be completed within a short time. The new addition will add to the company's facilities for handling the pressure of business now in hand.

Twelfth International Congress of Navigation.

The Twelfth International Congress of

Calendar

ST. LOUIS SHOW: April 24th to 29th. Motor boat show.

BERMUDA RACE: June 17th, 2 p. m. This race will start from the flagship of the Motor Boat Club of America, which will be anchored in Gravesend Bay, New York City, and the finish will be off St. David's Head, Bermuda.

ALBANY-NEW YORK RACE: July 1st. This annual race of the New York Motor Boat Club, will start at 6 p. m. and is open to all motor craft except automobile boats, less than 40 feet over all. Entries close June 28th.

NEW ENGLAND ENGINE & BOAT ASSOCIATION: July 4th. Fifth annual open motor boat race for the championship of New England, held off the club house in Boston Harbor.

Dubuque, Iowa: July 4th, 5th and 6th. Annual regatta. Prizes aggregate \$5,000.

YACHTSMEN'S CLUB OCEAN RACE: July 8th. This race will start from a point near Atlantic City, and will go to Scotland Lightship, thence to Fire Island Lightship, and return. Held under the auspices of the Yachtsmen's Club of Philadelphia.

MACKINAC ISLAND CRUISE: July 22nd. Cruising race held by the Chicago Yacht Club.

HALIFAX RACE: July 22nd. Start of Reciprocity Race from New York to Halifax, conducted by the Brooklyn Yacht Club for the William Randolph Hearst Trophy.

NEW YORK TO CAMDEN: August 4th. This race will start from the club house of the New York Motor Boat Club and will finish off the club house of the Camden (N. J.) Motor Boat Club.

SCRIPPS CRUISE: August 7th to 14th. This race will start from Detroit and will finish at Buffalo, held under the auspices of the Great Lakes Power Boat League. Distance, about 600 miles. Open to power boats not under 30 feet in length.

WESTERN POWER BOAT ASSOCIATION: August 8th and 9th. The third annual regatta of this association will be held at Peoria, Ill. Entries close August 5th.

GOLD CUP RACES: August 8th, 9th and 10th. American Power Boat Association races held at Frontenac on the St. Lawrence River.

BRITISH INTERNATIONAL RACES: August 24th, 25th and 26th. These races will be held in Huntington Harbor, Long Island Sound, for the Harmsworth Trophy, successfully defended last year by Dixie III.

NATIONAL ASSOCIATION OF ENGINE & BOAT MANUFACTURERS: September 4th to 9th. Annual national motor boat carnival held in conjunction with the Motor Boat Club of America, at Huntington Bay, Long Island.



A motor sled equipped with a 36 H. P. Watertown motor.

Navigation is to meet in the city of Philadelphia, Pa., some time during the year of 1912, sitting probably about one week. The exact date will be determined by the permanent International Commission, and that information will be given out later. The program of the convention will include a series of questions and communications on Inland Navigation and another on ocean navigation. These congresses have done an immense amount of good in the past and it is without a doubt that the coming congress will prove as useful as the rest.

Michigan Branch in New York.

The Michigan Wheel Company has opened an eastern branch at the corner of Broadway and Dey street, New York City.

A. B. Sands & Son Co.

In the December number of MotoR Boating, in the advertisement of the above company, through a typographical error their Plate S-145 Folding Lavatory was listed at \$15. This was incorrect, the price being \$45. MotoR Boating takes this opportunity of making the correction.

J. W. Durkee's Fire Extinguisher.

The Durkee fire extinguisher, marketed not so long ago by Joseph W. Durkee, seems to be making good, as a motor boat safeguard. It is built in the shape of a syringe, or squirt gun, operating with an up and down stroke, and contains three pints of a liquid gas. This gas, when subjected to higher temperatures, becomes immediately converted into a vapor,

much heavier than air, which settles down about the flame and, excluding the oxygen, smothers it. The Durkee gun is 16 inches long and throws a stream 30 feet in any direction. The liquid gas will not deteriorate with age, and, in case of fire, if there is an appreciable amount of the liquid left, the handle may be rehooked and the extinguisher hung up again ready for future use without having to be recharged till the full amount contained therein is used. The gun is selling for \$5.

A Motor Ice Sled.

The novel motor sled, shown on this page, was designed and is owned by C. J. Swain, of Philadelphia, and was built at the machine shop of the Shelly Tool Company, at Saranac Lake. The frame is 14 feet long, 3 feet 1 inch wide, and is 13 inches above the ice. It is built of one-quarter inch angle iron, reinforced along the sides by half-inch steel strips. The frame is supported by truss rods. The sleds are patterned after ordinary "bob" sleds, and are made of wood reinforced on both sides by one-eighth inch bands of steel. A 36 h.p. four-cylinder, two-cycle, Watertown motor furnishes the power. The propeller is a five-foot aeroplane wheel, having a three-foot pitch. It is said that this air-driven sled has attained a speed of 70 miles an hour, and that its speed possibilities have scarcely been tried.

New Boat and Engine Company Fares Well.

The Valley Boat and Engine Company, one

of the new industries of Saginaw, Mich., is reported as progressing at a good rate. Orders are coming in rapidly and the force of employees has lately been increased. The company is located at 2624 South Washington street, in a new building, and has been in operation for about six months. Boats of all kinds are being manufactured and sent to many parts of the world. The concern has shipped boats to Cuba, three to Denmark, Costa Rica, Honduras, Panama and many other places throughout the world. Engines have also been shipped abroad in the knock-down style, this probably being the only firm that manufactures and sends out engines in this form.

West Mystic Dorries.

The West Mystic Boat Company of West Mystic, Connecticut, have recently delivered to the Mexican International Boundary Commission, one of their 20-foot dorries, an exact duplicate of the one sold to the United States International Boundary Commission last fall. These boats are especially adapted for carrying a large party of laborers and for navigating shallow waters. They were built sufficiently strong to withstand any encounter with snags and floating roots or trees. In addition to the regular side strip seats, removable thwarts and rowlocks were fitted so that the boat might be manned with oars and rowed in water too shallow for the propeller. They are equipped with 5 h.p. Lathrop motors, with reverse gear and forward control.

A Motor Hospital Boat.

E. A. Reine and Company, of Helsingfors, Finland, have recently built to the order of the Railway Department of the Russian government, a motor hospital boat, which is primarily intended for the use of the medical officer in the Wilna district of Russia, where she will be employed in transporting patients suffering from cholera from the outlying provinces into the hospitals. The vessel is 72 feet long, with a 9-foot beam, and draws only 16 inches of water. The boat is powered with a Thorncroft, 36 horsepower, paraffin engine. The boat has a speed of ten knots under working conditions. She was delivered a month or two ago and is now actively engaged in the Wilna district.

Brunner Increase.

Owing to the increased pressure of orders the Brunner Manufacturing Company of Utica, New York, manufacturers of the Parker air compressors and whistle outfits, announced recently that they had found it necessary to find larger quarters in which to conduct their business. They are now located in a new plant at Gray and Capital avenues, Utica, that is four times the size of their former quarters, enabling them to accordingly increase the amount of their output.



The third annual dinner of the Marine Supplies Association of America, held at Hotel Marie Antoinette, New York City, February 23d.

Tuttle Motor Co. Metropolitan Agency.

The Tuttle Motor Company, of Canastota, New York, formerly the D. M. Tuttle Company, have completed arrangements for the handling of their line in the Metropolitan district of New York, with the Hudson Engine Company, whose offices are located at 120 Liberty street. A full line of the well-known Tuttle motors will be shown on their salesroom floor, and all inquiries received from the Metropolitan district will be given prompt attention.

Carman and Bowes Carry Large Line.

One of the most enterprising firms in Pennsylvania dealing in gas engines and accessories is that of Carman and Bowes, marine and aeronautical engineers, with headquarters in the Philadelphia Bourse. They are exclusive distributors in Pennsylvania, Delaware and New Jersey, for the following well-known engines: Standard, Loew-Victor, Elbridge, aero and marine; Reynolds' Rotary Valve, Perfection and Oriole. They are also selling agents for the Orswell waterproof ignition system and the well known products of the Byrne Kingston Company and the Kokomo Electric Co., manufacturers of the "Kingston" carbureting and ignition specialties.

Anderson in Australia.

The Anderson Engine Company of Shelbyville, Illinois, report that they have just made the sale and shipment of nine marine engines, ranging in size from $2\frac{1}{2}$ to 8 horsepower, to Brisbane, Queensland, Australia.

Smith and Baldrige Gears.

Although the Smith and Baldrige Machine Company, of Detroit, Mich., did not have an exhibit of their own at the New York National Motor Boat Show, their reverse gears were nevertheless to be seen in more than one place by visitors at the show. The Reliance Motor Boat Company exhibited two of them in speed boats, and the National Boat and Engine Company showed the gears in several of their launches. In the display of Fairbanks-Morse and Company, one of the Baldrige gears was shown in skeletonized form, and it drew no little amount of attention.

The Perfex Ignition System.

Although the 1910 sales of Perfex Waterproof Power-adding Ignition were said to be five times as great as its large sales of the previous year, and in spite of the fact that its manufacturers, the Electric Goods Mfg. Co., of Canton and Boston, Mass., have quadrupled their output capacity for this year, the large advance orders indicate that they will be rushed to the limit of their production. Statistics show that 50 per cent. of all the engine manufacturers at the New York Show exhibited motors equipped with "Perfex" ignition, and the new Perfex "Rectified" Magneto enjoyed a large sale.

A Matthews' 72-Footer.

The accompanying illustration shows a 72x12 x4 foot cruiser building at the yard of the Matthews Boat Company, of Port Clinton, Ohio, for a prominent yachtsman of Cleveland, O.

The construction provides for oak keel and frames; cedar planking, copper sheathed be-



The new offices in Cleveland of the Ferro Machine and Foundry Company.

low the waterline over felt; oak hull mouldings; teak decks with the exterior and interior of the cabins finished in highly figured Tobasco mahogany, panelled throughout. The boat is operated entirely from the bridge deck, and is to be equipped with two 60 h.p. heavy-duty, 4-cylinder motors. These



The Durkee fire extinguisher.

motors are placed in the motor room, separated from the balance of the boat by two steel water-tight bulkheads. Two additional watertight bulkheads are also placed in the boat for rigidity and safety.

The crew's quarters forward are arranged with two pipe berths, lavatory, and a flush-

ing closet. Separated by a wooden watertight bulkhead, comes the dining saloon, arranged with alcoves and a buffet, with lavatory compartment adjacent. A special dining-room table, folding chairs, and two folding emergency berths complete the furnishings.

The galley is immediately aft, extending the full width of the boat, and fitted with a large zinc-lined ice-box, enamelled iron sink, dish racks, and 4-hole Shipmate range ventilating into the first stack. The companionway is on the starboard side from the lobby to the deck.

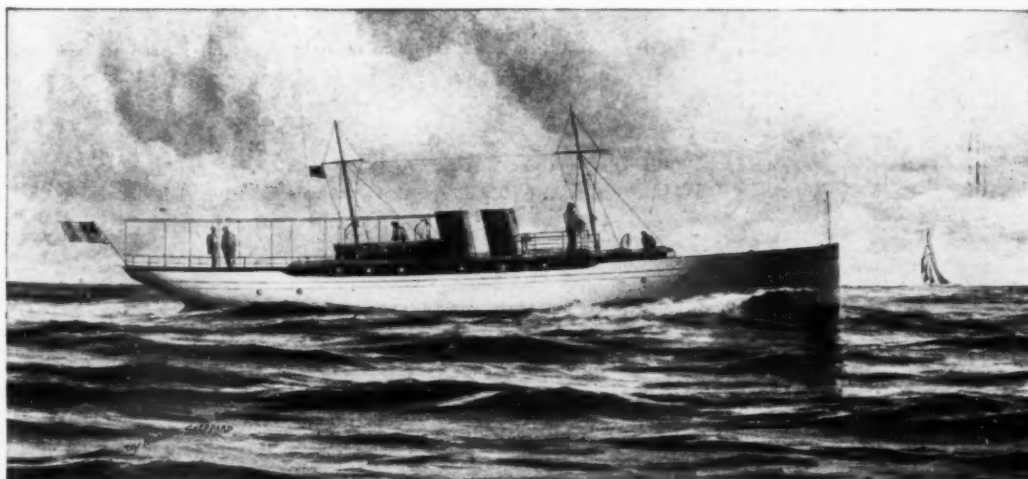
The engine-bed construction in the motor room is especially noteworthy, as it is built very secure, and extends a distance of over 36 feet in length in a fore-and-aft direction in the boat, in order that all possible vibration may be obviated.

An independent electric lighting plant is placed in the motor room, operating at 110 volts. In connection with this, is an emergency storage system with an emergency fixture in each room. Regular fixtures are installed to suit the positions available in the different compartment. The headroom throughout the boat is six feet six inches.

The after cabins are devoted to the owner's service, and arranged with a bathroom on the starboard side, fitted with tub, lavatory, and flushing closet. The lavatory compartment is tile-lined, and finished in white enamel. The owner's stateroom adjoining is fitted with a berth 4 feet, 6 inches in width, a large hanging locker, a dresser, and shelves. Ventilation is secured through ports and the skylight.

The after cabin is arranged in one large room, with seats making up into four berth lengths, with special alcoves over. The entire after portion of the boat is covered by an awning. The bridge deck is surrounded by brass deck rails with two special bronze stands, on which are mounted controls for each engine. No expense has been spared in the construction of this boat to make it one of the most attractive boats of the year, and with its good freeboard and low houses, as well as seaworthy type of hull, the design is especially adapted to rough-water cruising. A well-balanced design results from the use of two stacks and the ample accommodations both above and below decks make the craft a most comfortable one for the waters in which it will be used.

The boat will be used at the owner's summer home in Connecticut after the present season on the Great Lakes. Every possible electrical convenience is installed, and the type and construction will undoubtedly create a great deal of interest in boating circles.



A 72-foot cruiser built by the Matthews Boat Company.

The New York to Halifax Race.

(Continued from page 6.)

Sails:—Sufficient sails for steadying the boat should be carried and the masts should be of sufficient size and stayed properly to carry them in heavy weather.

Life rafts, etc:—Generally speaking, the tenders carried by the small cruisers would be worthless in a sea, if they could be launched, and the only thing that the writer has found to be of use on the small motor yacht is a life raft on the order of the Carley Life Rafts. A little raft 6 ft. x 3½ ft. in diameter would support and safely carry six persons and such a raft if procurable would be the best thing. Of course, it would be convenient to have also, a small tender for going ashore when in port. There should be one life preserver for each member of the crew and a life ring with a rope attached, conveniently placed so that it can be thrown overboard in case of a person being washed or falling overboard. If this is arranged with a small pole running through it so as to stand vertically when the ring is floating and have on each end a small flag, it could be more easily picked up by anyone in the water.

Supplies and water:—Supplies and water sufficient for twice the length of time estimated for the trip should be carried. Water should be carried in fixed tanks at least two in number, and besides this, there should be a wooden water breaker to form part of the equipment of the life raft. In regard to provisions for a small boat for rough weather, when it is hard to get the meals, tinned goods are procurable so that by punching a hole in the tin and pouring water in the double casing, the contents are heated up which is a great comfort to the crew. A coal or wood stove of

the shipmate type also adds greatly to the comfort of the crew cruising down East.

Equipment:—All the equipment specified by the U. S. Gov. regulations should be carried, such as lights, bells, whistle, etc. Boats should be supplied with at least two anchors, the heaviest one should weigh in pounds at least twice the length in feet of the boat, and should have attached to it five or six fathoms of chain to which the rope should be attached if a rope is used. A good compass of at least 4½ inches in diameter, properly adjusted, should be attached and arranged so as to be easily seen by the steersman and should be provided with both oil and electric light. Too much care cannot be given to this little detail as on this greatly depends the safety and results of the race. If the inside course is taken, no sextant or chronometer is needed, but a good log of some reliable make should form part of the equipment, together with sounding lead, charts in detail and the Coast Pilot.

Entries:—If some arrangement could be made, whereby people entering the race would have to make a deposit, which deposit would be returned if they started, this would be a good thing. In the last Bermuda race, no less than six boats were to enter, but when the time came to start there were only two, in fact, one of these was not ready to start at the appointed time. In regard to the types of boats admitted, they should be wholesome, heavily built boats, with tight hatches and air ports and with either flush decks or self-bailing cockpits, the floors of which should be well above the water line and have scuppers of ample size.

"The engine and reverse gear should be ar-

ranged so as to be accessible from all sides and easily worked on. Inside stuffing boxes should be required and a hand bilge pump of ample size and fire extinguishers should form part of the equipment. The installation of the engine throughout should be most thoroughly gone into, no gasoline pipes of less than ¼ inch, inside diameter, should be permitted and double pipe lines would be advisable. All tanks should be of the permanent built-in type, properly choked and stayed and heavy in construction, having their outlets so arranged that if the gasoline becomes low, the rolling will not uncover them and thus make the flow of the gasoline intermittent.

"A race of this class is of great value to the yachting world in general, as it promotes a healthy type of boat and teaches seamanship that could not be learned in any other way. The result of the race usually depends more on the reliability of the outfit and seamanship of the crew than it does on the speed. This was well brought home to the writer in the last Bermuda race, for although Yo Ho was around two miles slower per hour than the Eronel, she was beaten in actual time some three hours, and by corrected time, one hour and 15 minutes and in dirty weather as we had on the return trip, Yo Ho beat Eronel some nine hours on the return run from Bermuda to New York."

Many further suggestions and inquiries have been received by Chairman Bentley of the Brooklyn Yacht Club, and he already reports the provisional entry of Caroline, Mr. Frank Dennis, the Havana Racer and of Eronel II, Mr. S. A. Cochrane's winner of the 1910 Bermuda Race.

Lubricating Systems.

(Continued from page 43.)

| Maker and Engine. | H. P. | No. of Cyl. | Bore and Stroke. | Method of Lubrication. |
|----------------------------|-------|-------------|------------------|--|
| Eagle Company Models..... | 1½ | 1 | 3 x 3 | Gravity through intake manifold, grease cups on main bearings. (Company also recommends lubrication through gasoline). |
| | 2½ | 1 | 3½ x 4 | Ditto. |
| | 3½ | 1 | 3½ x 4 | Ditto. |
| | 7 | 2 | 3½ x 4 | Ditto. |
| | 11 | 3 | 3½ x 4 | Ditto. |
| | 15 | 4 | 3½ x 4 | Ditto. |
| | 6 | 1 | 4½ x 5 | Ditto. |
| | 12 | 2 | 4½ x 5 | Ditto. |
| | 18 | 3 | 4½ x 5 | Ditto. |
| | 25 | 4 | 4½ x 5 | Ditto. |
| | 5½ | 1 | 5 x 6 | Ditto. |
| | 12 | 2 | 5 x 6 | Ditto. |
| | 7 | 1 | 6 x 6½ | Ditto. |
| | 15 | 2 | 6 x 6½ | Ditto. |
| | 4 | 1 | 5 x 6 | Ditto. |
| Bridgeport Motor Co..... | 3-4 | 1 | 3½ x 4 | Gravity oil cups double feed to cyl., grease cups on main bearings. |
| | 4-5 | 1 | 4½ x 5 | Ditto. |
| | 5-6 | 1 | 5½ x 5 | Ditto. |
| | 7-8 | 1 | 5½ x 5½ | Ditto. |
| | 9-10 | 1 | 6½ x 6½ | Ditto. |
| | 6-8 | 2 | 3½ x 4 | Pressure feed from crank case, into reservoir, thence to cyl. and cr. case, grease cups. |
| | 8-10 | 2 | 4½ x 5 | Ditto. |
| | 10-12 | 2 | 5½ x 5 | Ditto. |
| | 14-16 | 2 | 5½ x 5½ | Ditto. |
| | 18-20 | 2 | 6½ x 6½ | Ditto. |
| | 10-12 | 2 | 4½ x 5 | Ditto. |
| | 15-20 | 3 | 4½ x 5 | Ditto. |
| Holliday Eng. Co..... | 2½ | 1 | 3½ x 5 | Gravity oil cups to cyl., grease cups to main bearings. |
| | 7½ | 1 | 6½ x 7 | Ditto. |
| | 15 | 2 | 6 x 7 | Detroit Mech. oiler, driven by vertical rod from cam, feeds main bearings, crank case and cylinders. |
| Cameron Engine Co..... | 5 | 2 | 3½ x 5 | Gravity oil cups to cyl., grease cups to main bearings. |
| Toppan Motor Co..... | 30 | 6 | 3½ x 3½ | Through the gasoline. |
| | 3 | 1 | 3½ x 3½ | Gravity through intake manifold, grease cups on main bearings. |
| | 8 | 2 | 4 x 4 | Ditto. |
| | 5 | 1 | 4½ x 4½ | Ditto. |
| Mercury Motor Co..... | 25 | 4 | 4½ x 5 | McCord Force Feed, belt driven from cam shaft—feeds cyl., or case and main bearings. |
| | 40 | 4 | 4½ x 5 | Ditto. |
| | 100 | 6 | 6½ x 6½ | Circulating pump, splash, self-contained reservoir in base feeding everything. |
| H. C. Doman Engine Co..... | 12 | 4 | 4 x 5 | Detroit Mech. oiler, belt-driven, cam shaft, feeds cyl., grease cups and bearings. |
| | 20 | 4 | 5 x 6 | Ditto. |
| | 30 | 4 | 6 x 6 | Ditto. |
| | 40 | 4 | 7 x 9 | Ditto. |
| Erd Motor Co..... | 15 | 3 | 4 x 4 | Detroit Lubricator, belt-driven, from main shaft feeding all bearings. |
| Roberts Motor Co..... | 16 | 3 | 4 x 5½ | Osgood Mechanical, gear driven from timer shaft, feeds all bearings. |
| | 6 | 2 | 3½ x 6 | Gravity oil cups, through intake manifold grease cups, main bearings. |
| Rice Gas Engine Co..... | 315 | 16 | 6½ x 6½ | 4 Peterson Mech. oilers, gear driven from main shaft by secondary shaft, feed all bearings. |

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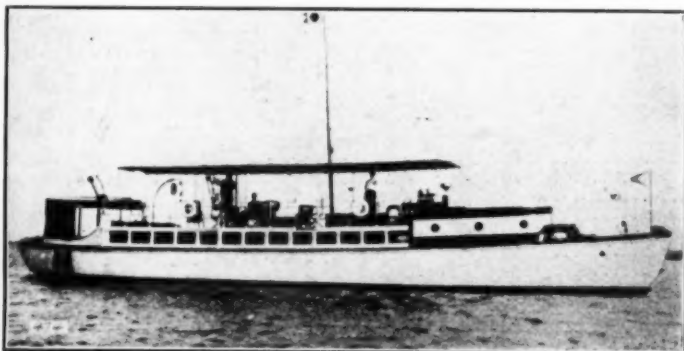
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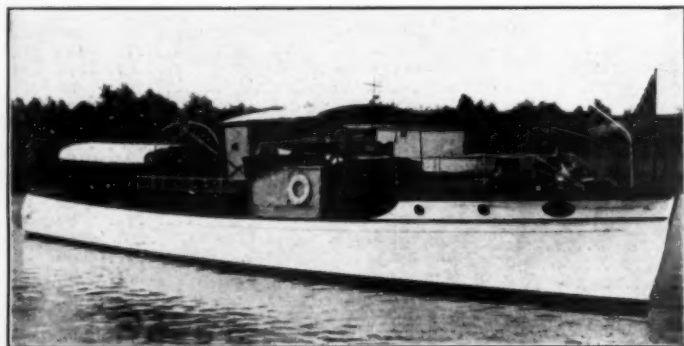
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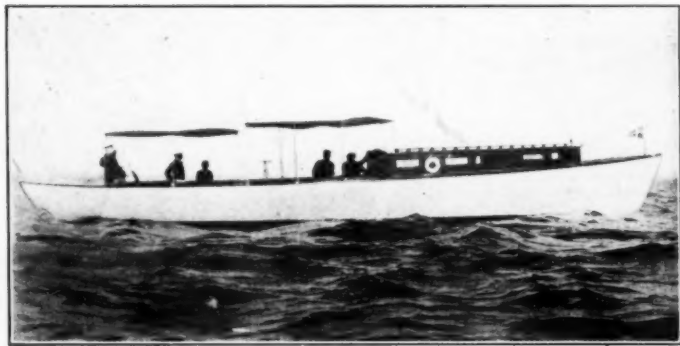
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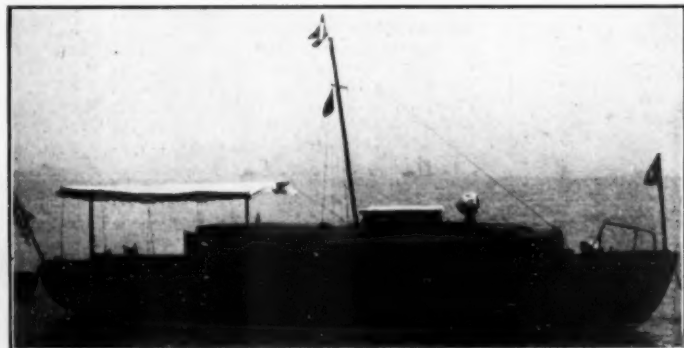
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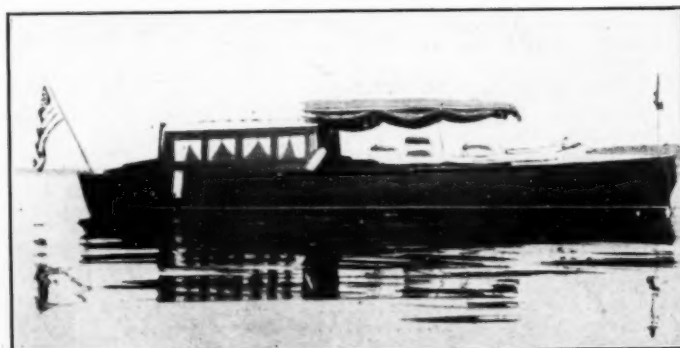
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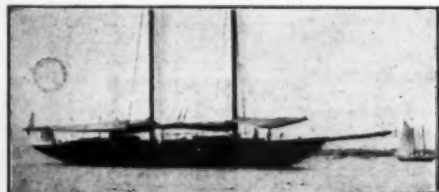
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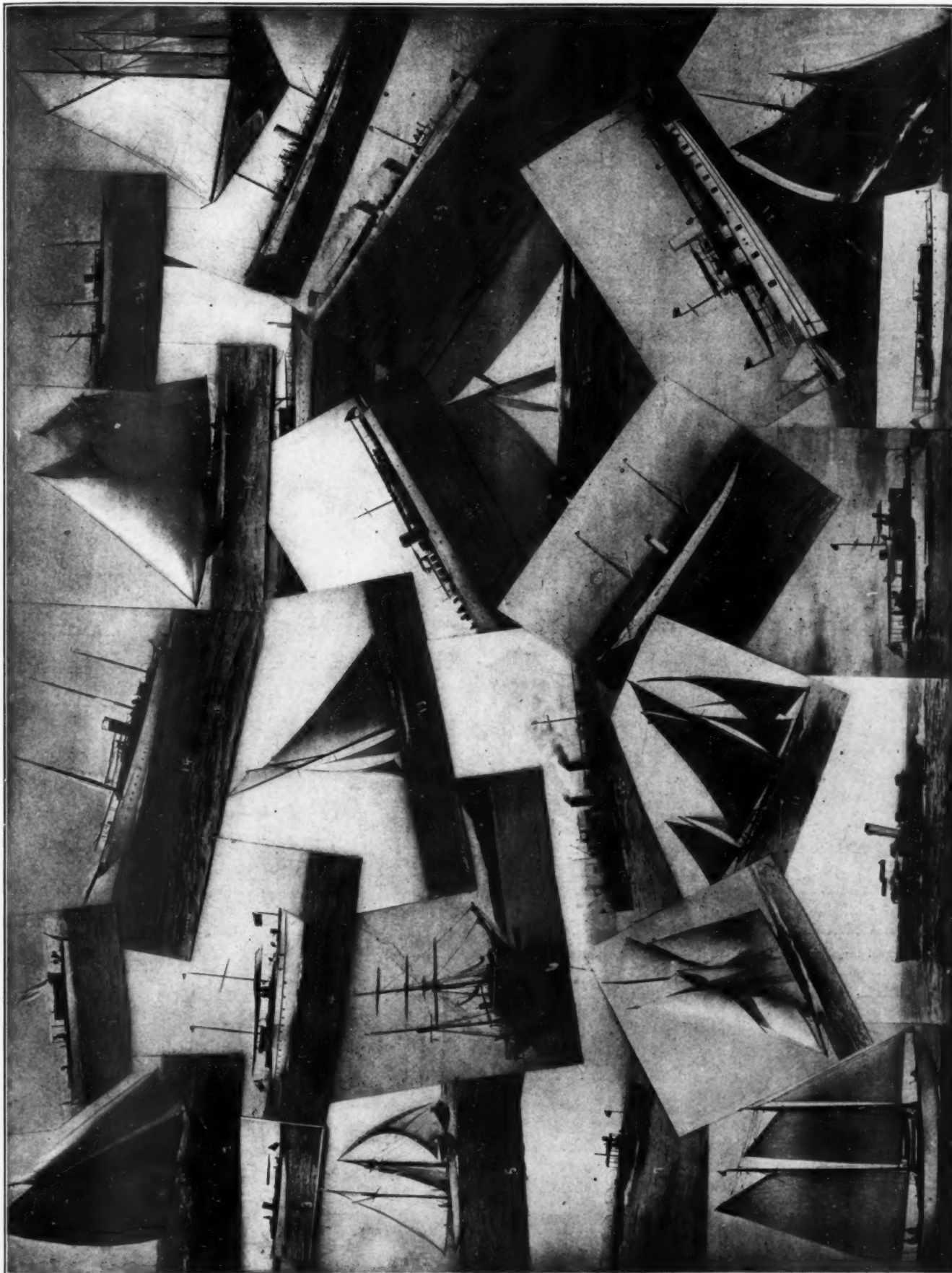
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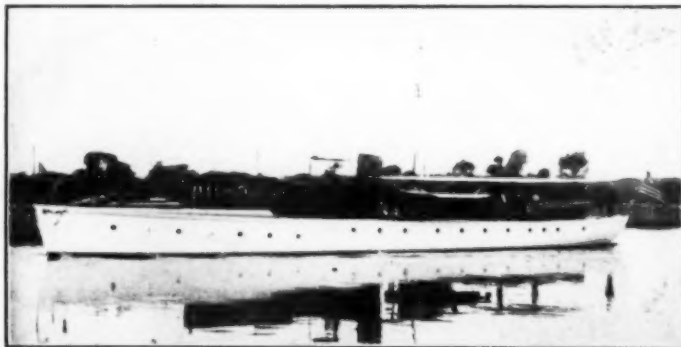
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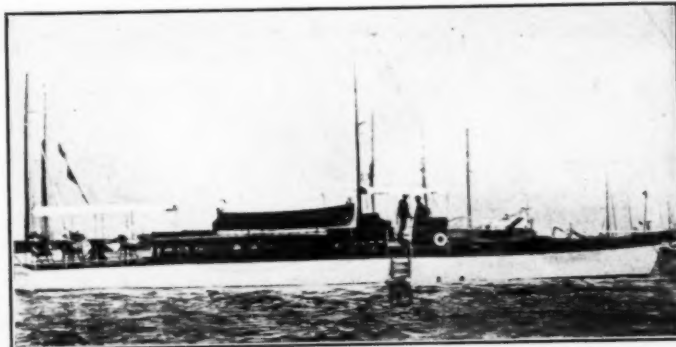
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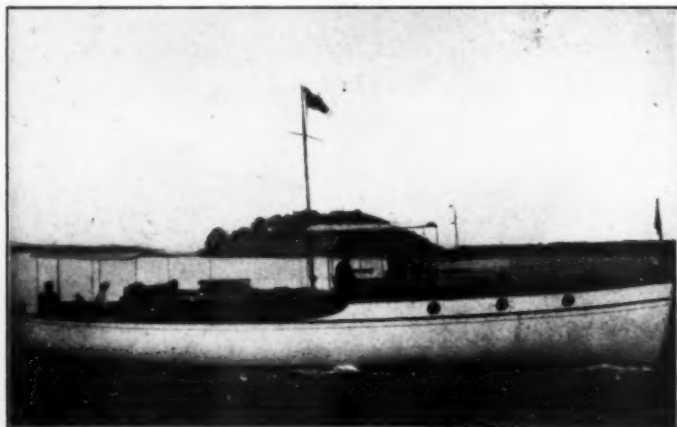
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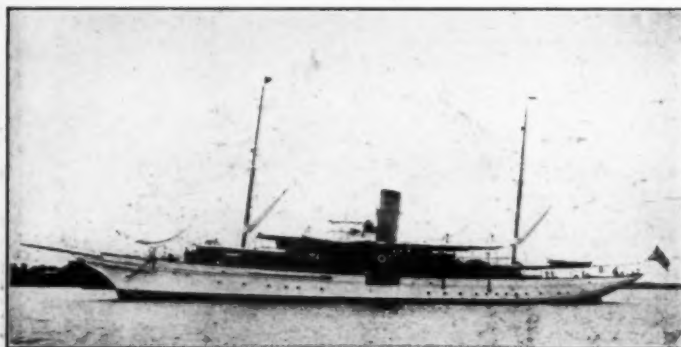
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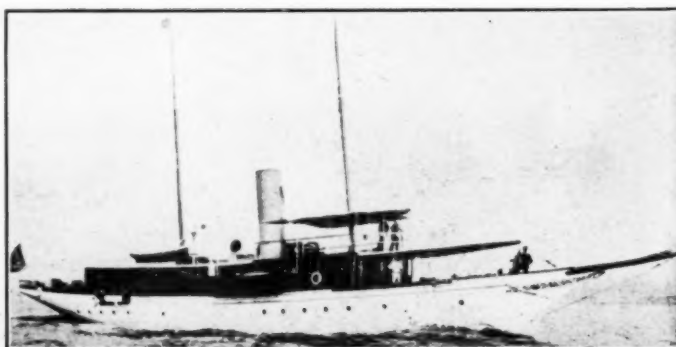
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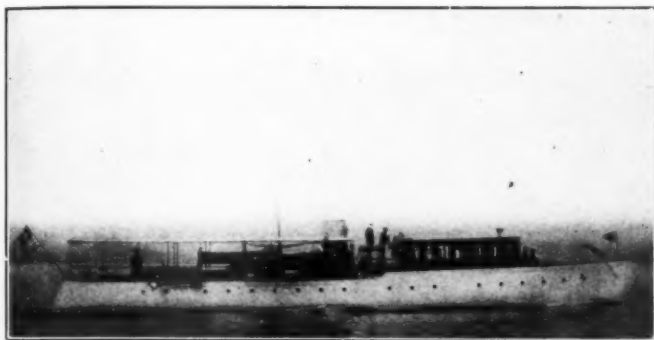
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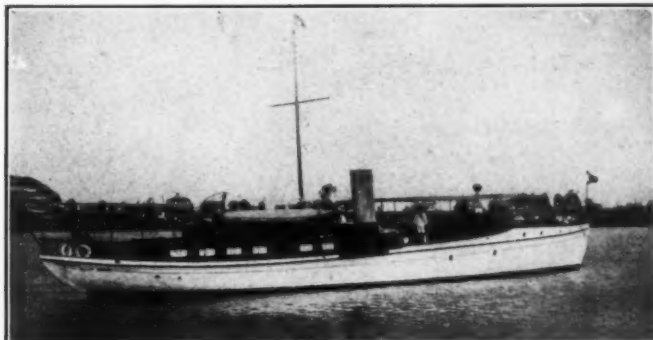
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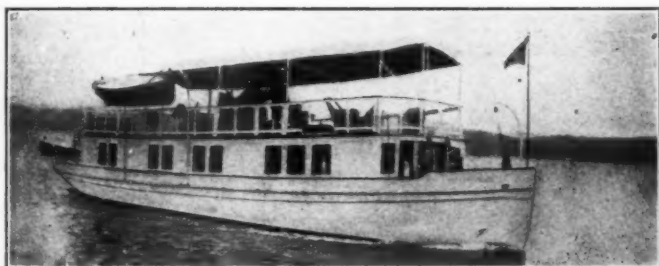
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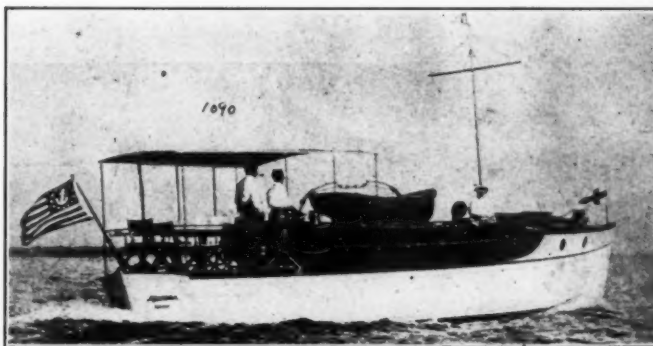
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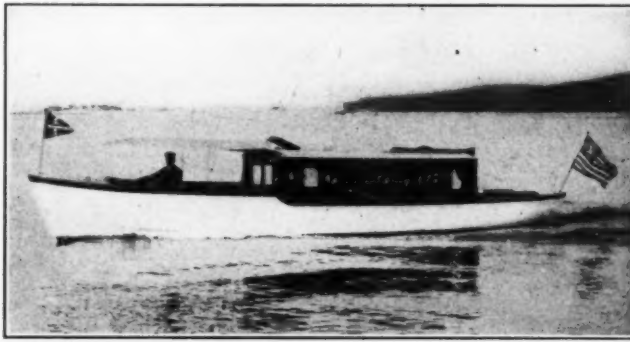
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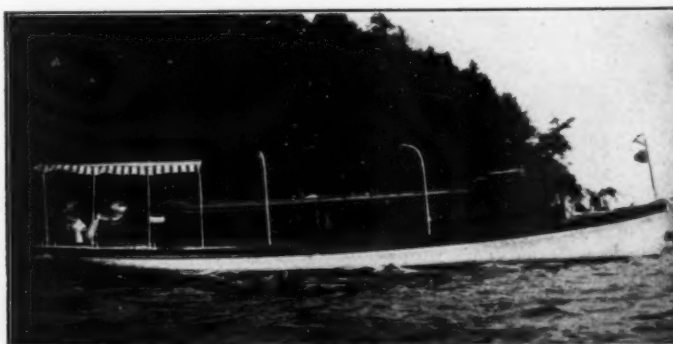
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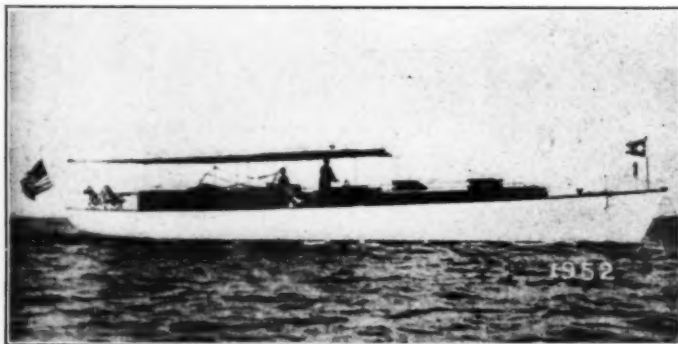
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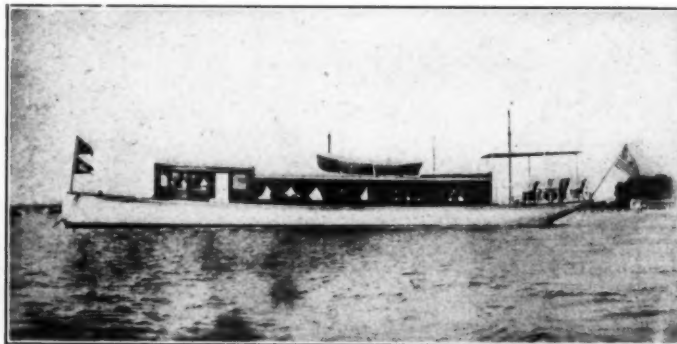
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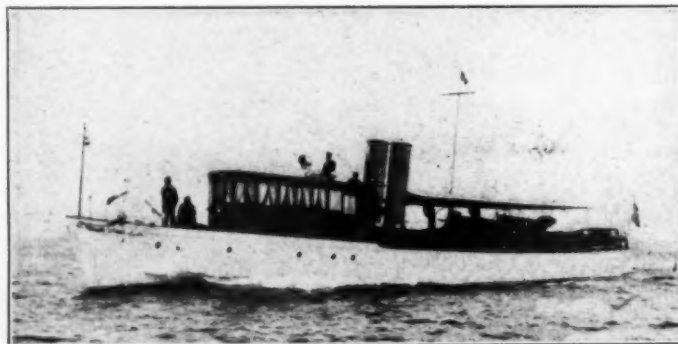
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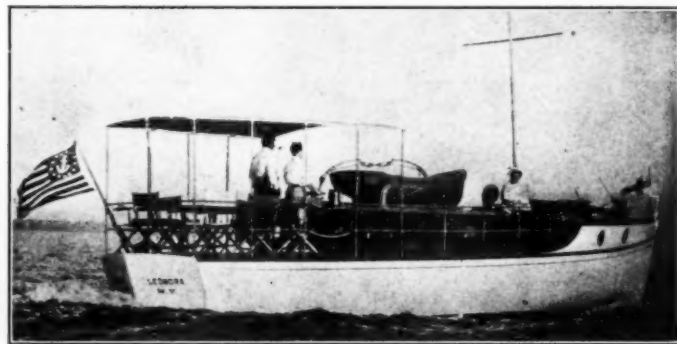
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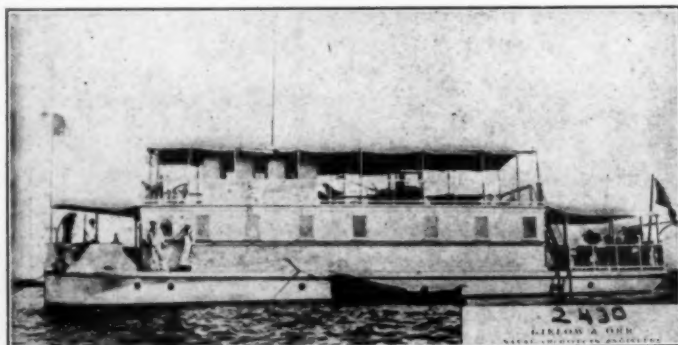
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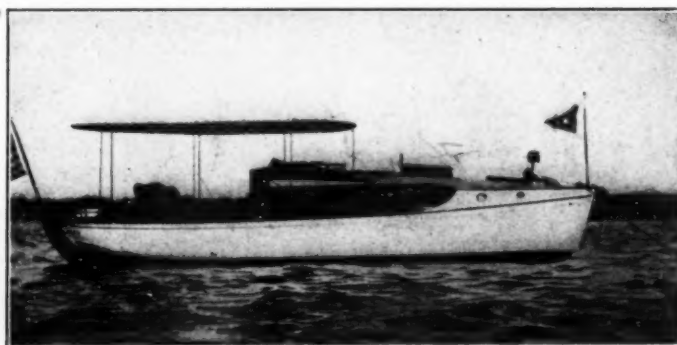
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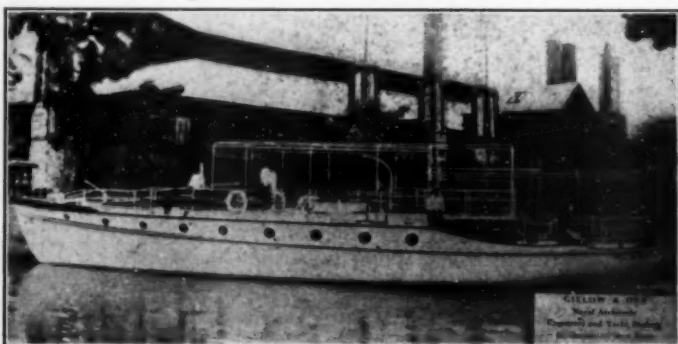
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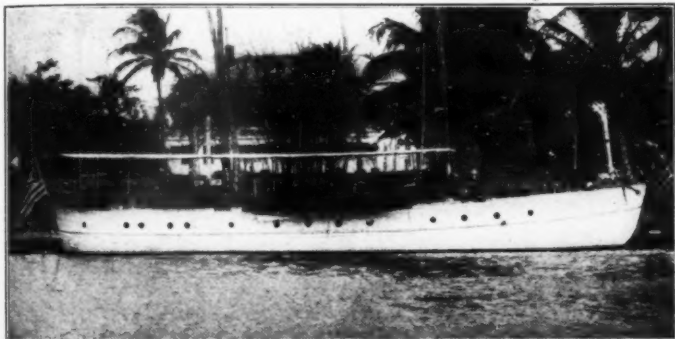
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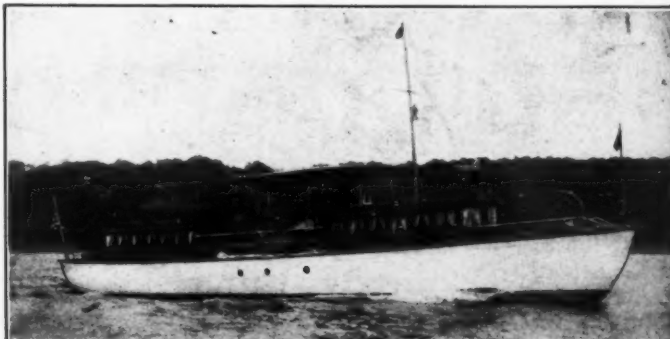
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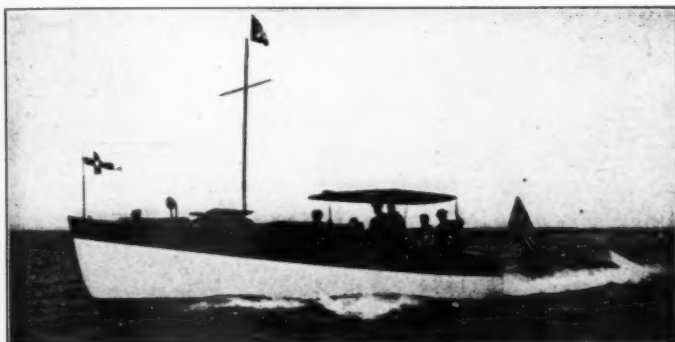
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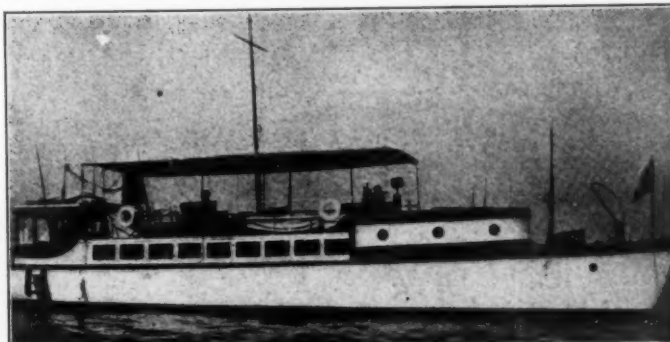
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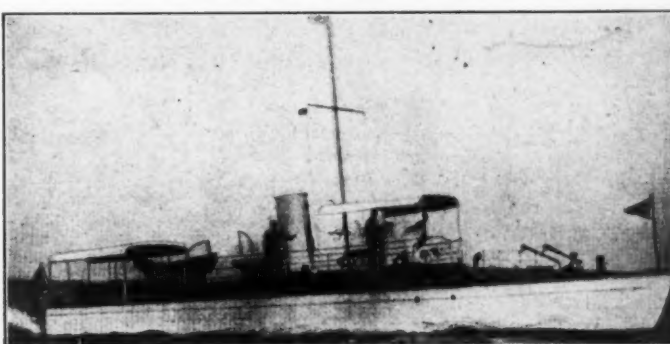
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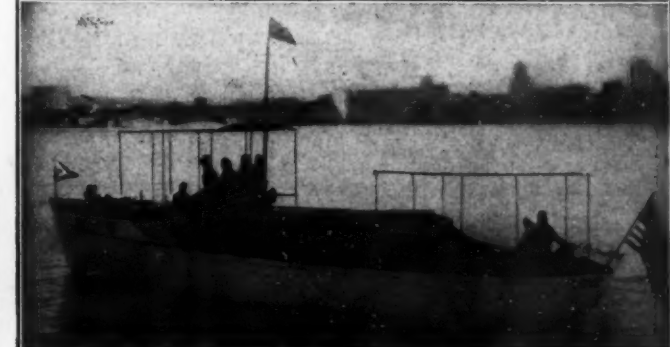
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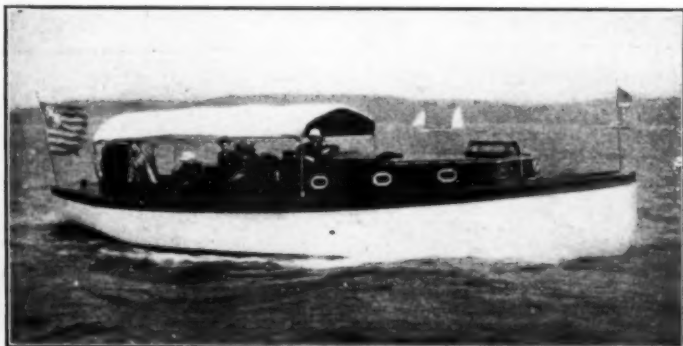
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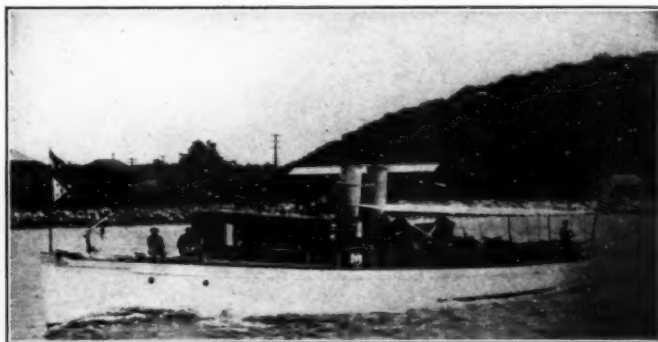
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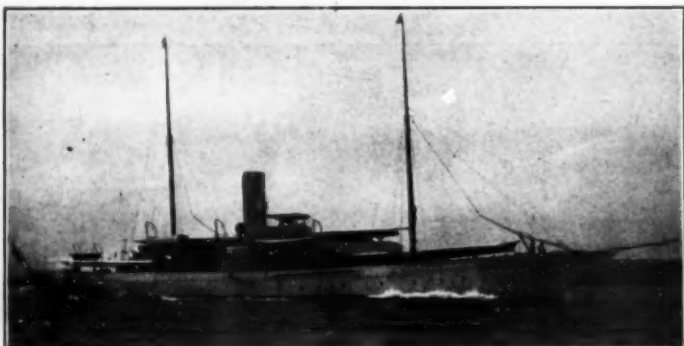
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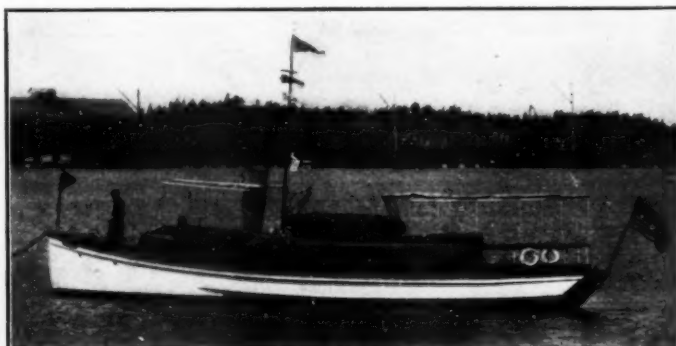
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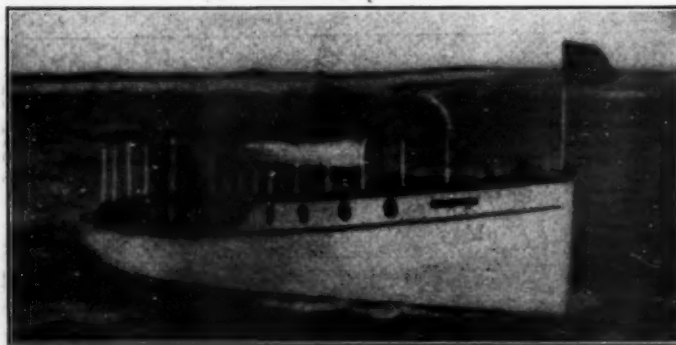
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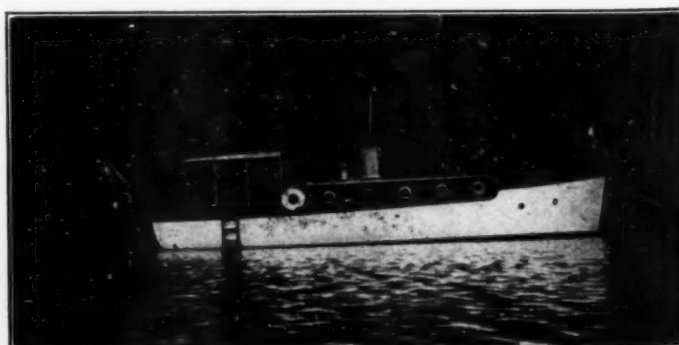
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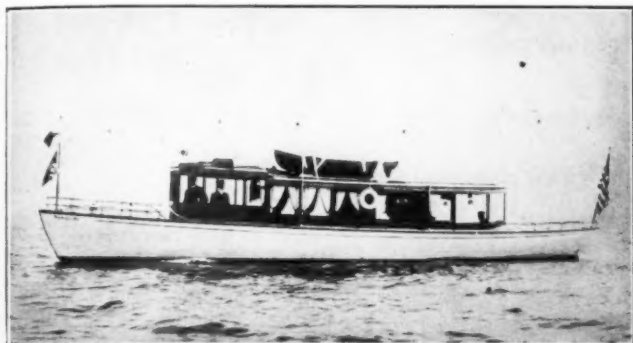
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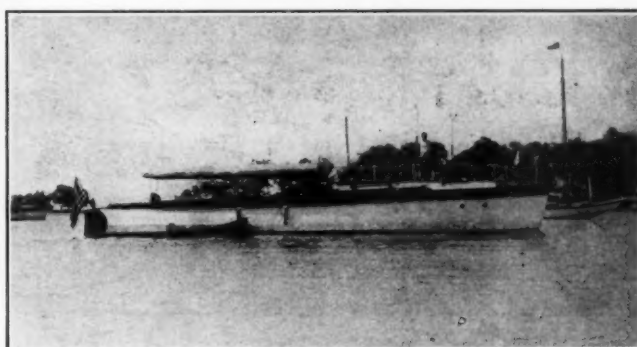
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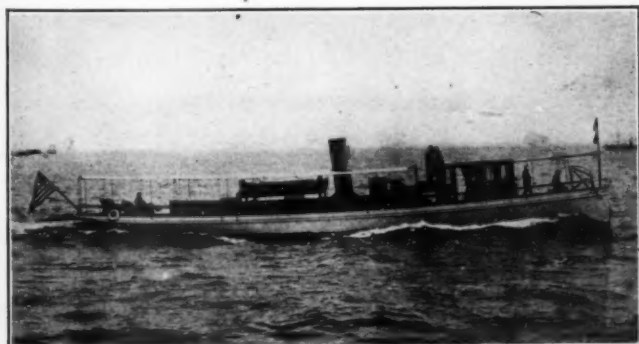
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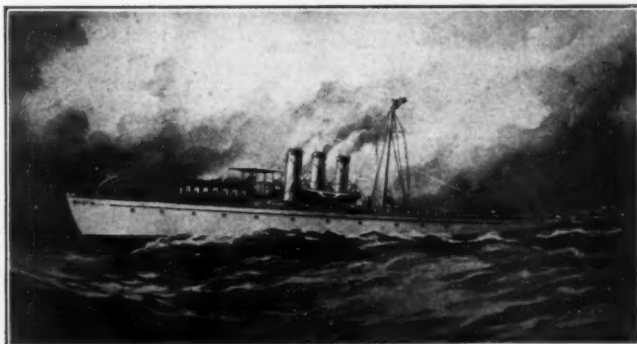
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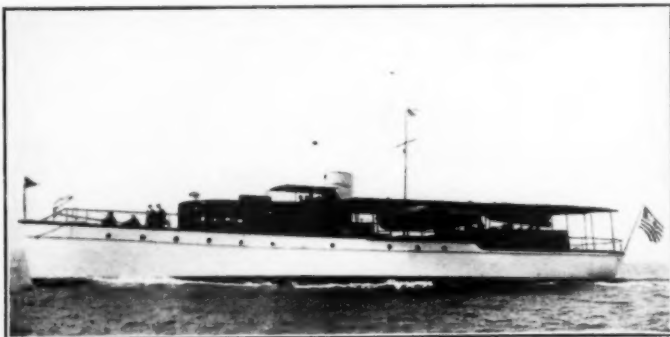
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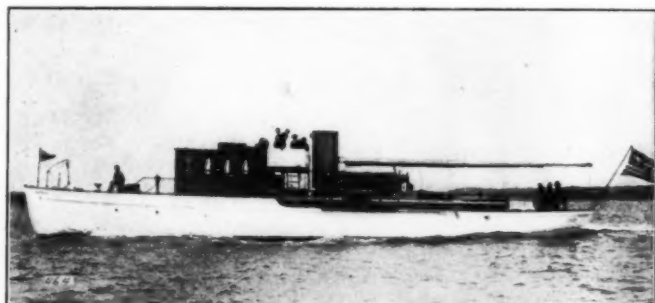
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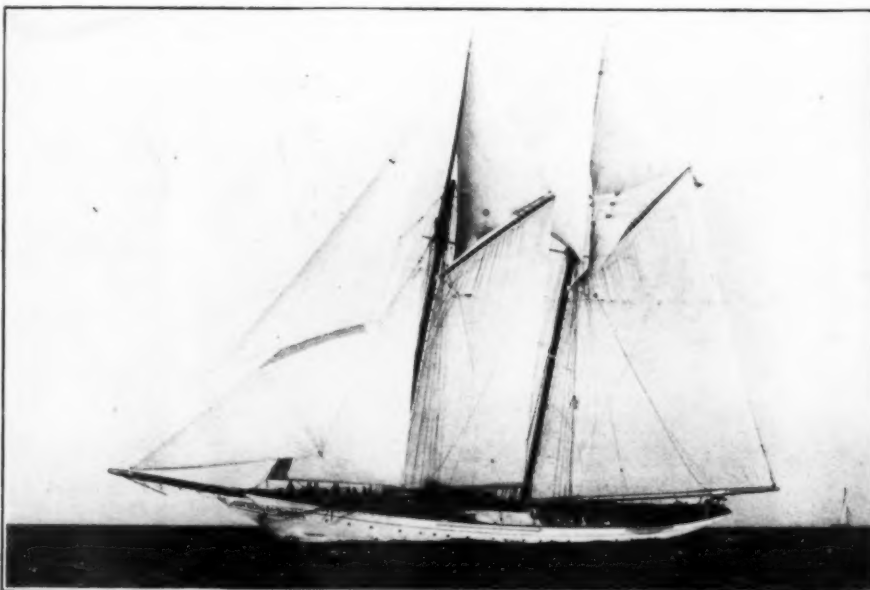
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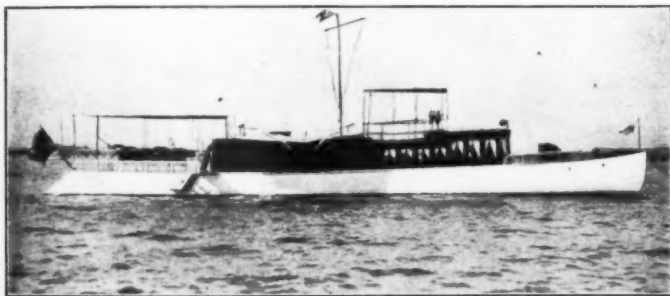
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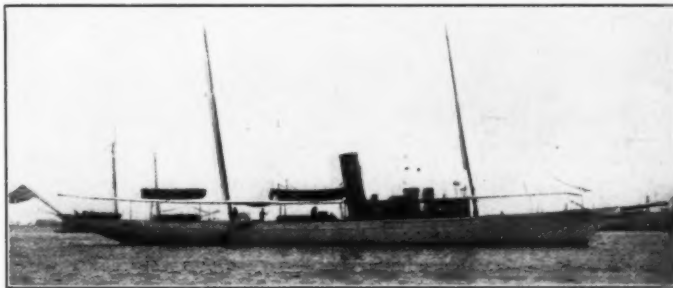
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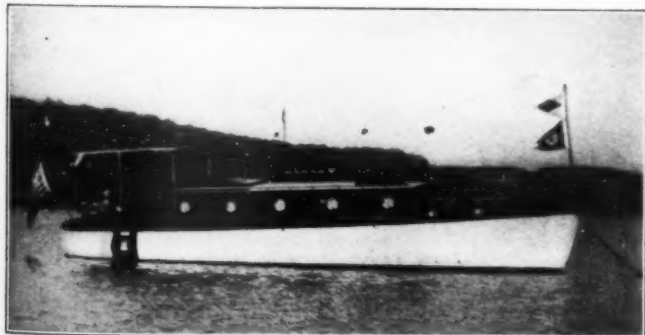
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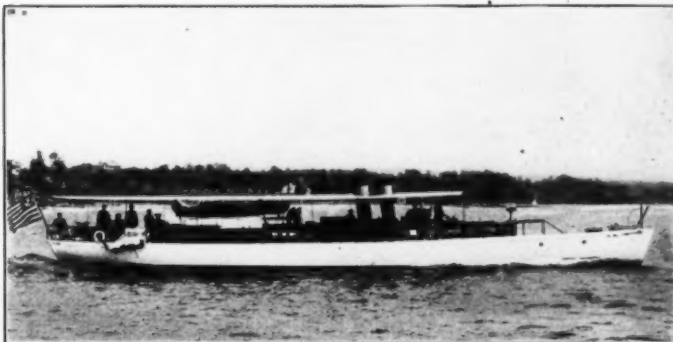
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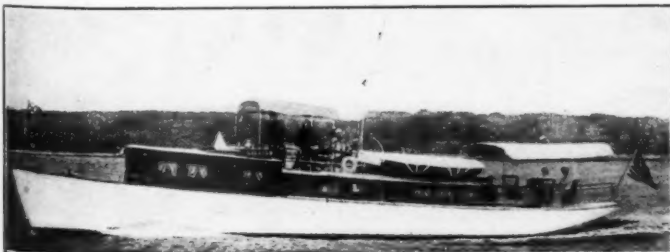
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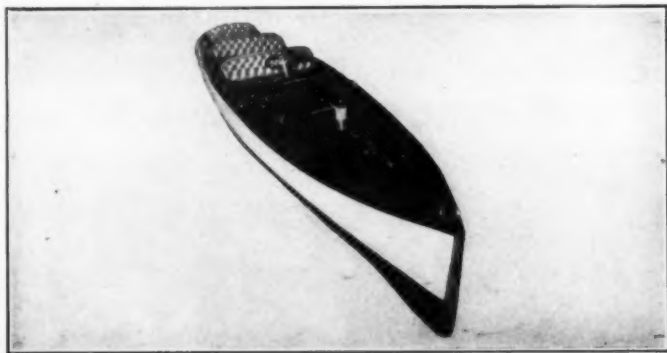
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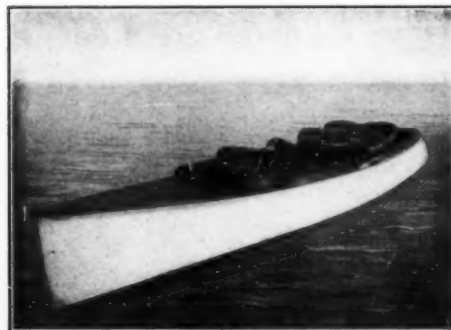
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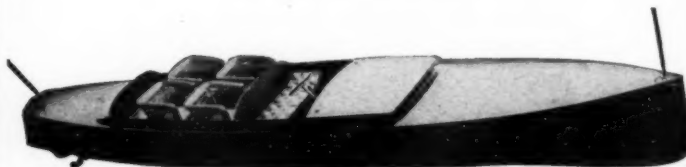
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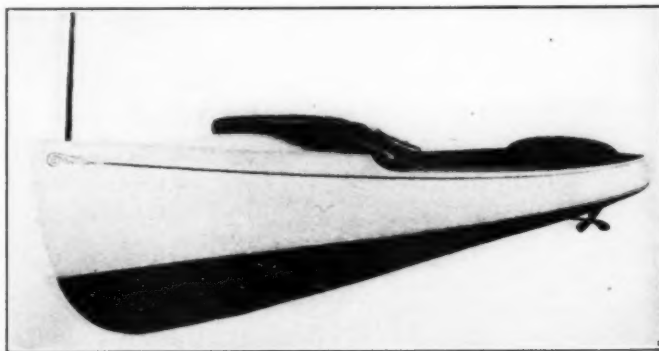
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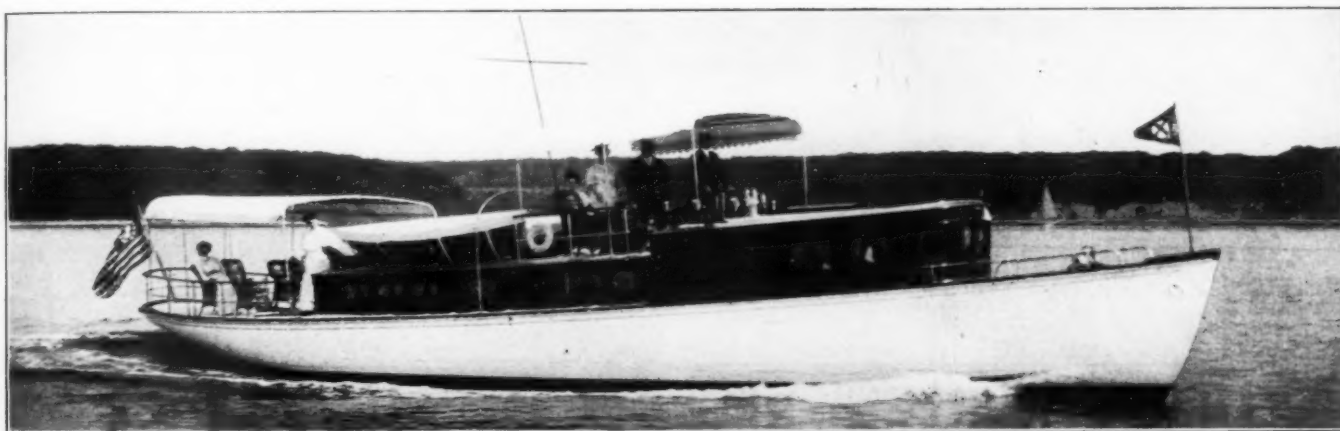
No. 20.—36 x 7.6 x 2.8 ft. Combination speed launch and cruiser, 45 H. P. Jager engine, large main cabin, stateroom, galley, toilet, A-1 order; 13 miles speed maintained; full headroom; built by Lawley; designed by Small Brothers.

Please mention MOTOR BOATING.



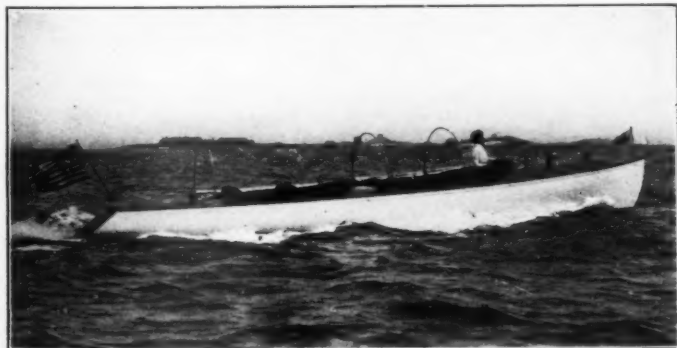
No. 717.—35 ft. x 8 ft. A-1 order; price very low; 15 H. P. 4 cylinder, 4-cycle Truscott motor; accommodations for four; galley; toilet room; completely equipped. Must be sold this month.

Please mention MOTOR BOATING.



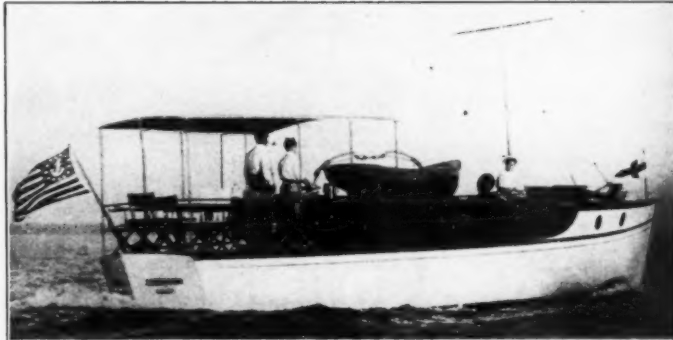
No. 296.—For sale or charter, high-grade power launch 65 ft. x 50 ft. x 13 ft. x 4 ft. 6 in.; two 18 H. P. Standard engines just sent to factory and thoroughly overhauled; large saloon; pilot house; double stateroom; speed 13 miles; electric lights, etc. Power tender with new two cylinder engine completely equipped in every detail.

Please mention MOTOR BOATING.



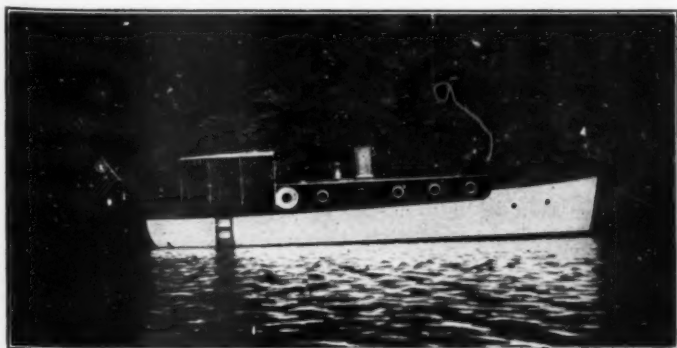
No. 561.—Launch hull, 35 ft. x 6 1/4 ft., designed by Binney; built by Fenton in 1909. In A-1 order throughout. Price only \$600.00.

Please mention MOTOR BOATING.



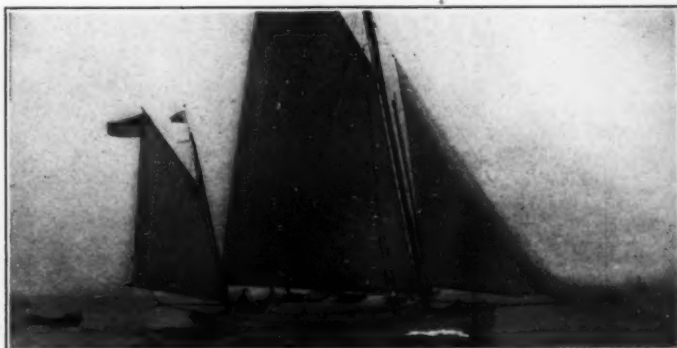
No. 679.—Cruising launch, 43 ft. over all, 38 ft. water line, 10 ft. beam, 3 ft. draught; built 1910. 18-24 H. P. Standard engine; speed 10 miles; large main cabin; double stateroom. Price low.

Please mention MOTOR BOATING.



No. 468.—For sale, cruising launch, 40 ft. over all, 36 ft. water line, 9 ft. 6 in. beam and built by Britt Bros. in 1909. 18-24 H. P. Standard engine; engine room; separate galley; large main saloon; small stateroom forward.

Please mention MOTOR BOATING.



No. 490.—Auxiliary cruising yawl, 46 ft. over all, 33 ft. water line, 11 ft. beam, 6 ft. draught, 12 H. P. Palmer engine; main cabin; double stateroom; toilet room; galley and forecabin. A-1 condition. Bargain.

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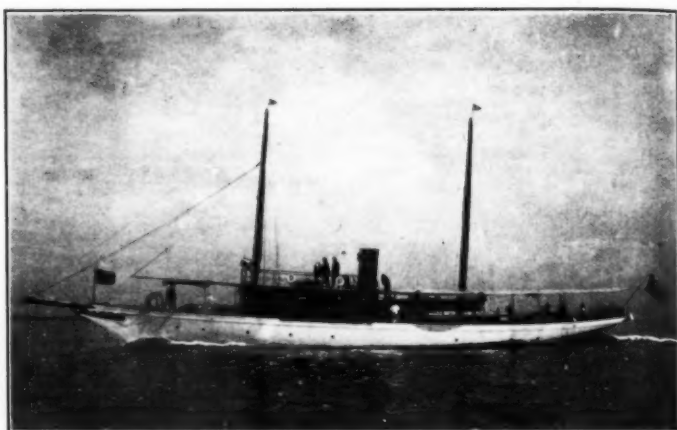
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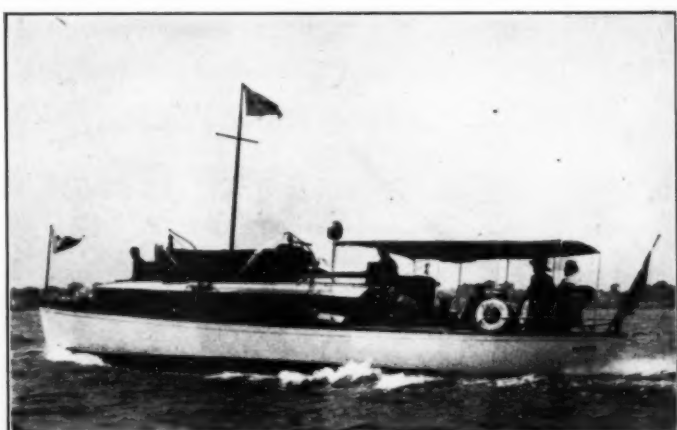
No. 416.—For sale, 140 ft. Auxiliary Brigantine.
Please mention MOTOR BOATING.



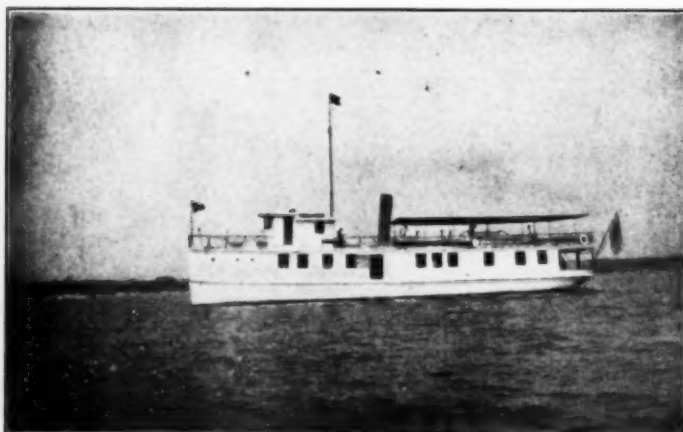
No. 485.—For sale or charter, 115 ft. Steam Yacht.
Please mention MOTOR BOATING.



No. 431.—For sale, 60 ft. Motor Cruiser.
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No. 340.—For sale, 45 ft. Motor Cruiser.
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No. 463.—For charter, 90 ft. Steam House-boat.
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No. 474.—For sale, 40 ft. Motor Cruiser.
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SPECIAL ANNOUNCEMENTS OF THE TRADE

The following special announcements, together with the regular advertisements throughout this book, make this number a complete directory of the principal manufacturers of the trade—of parts, accessories and other things closely connected with the motor boat industry. Before buying, it would be well for you to consult these announcements and write to the manufacturers. Please mention **MoToR BoatinG** when you write or otherwise communicate with the manufacturers. It would also be well to keep this issue by you for future reference.

Accessories

BREAK-DOWN INSURANCE—motor boat party on the river; 35 miles from repair station; motor stopped; gasoline lead supply pipe broken; instantly repaired by Allen Solderet; journey resumed and party enthusiastic over the trip and Allen Solderet. Complete soldering outfit prepaid, 25 cents. L. B. Allen Company, Inc., 4517 N. Lincoln St., Chicago, Ill.

MOTOR BOAT ACCESSORIES made from canvas or leather are our specialties—tool rolls, canvas boat covers, spark plug cases, etc. We should like to quote prices to motor boat accessory dealers or to sell direct to the owners. American Commercial Corporation, 110 West St., New York City.

TOOL KITS, WRENCHES, ETC., for the motor boatman. Every boatman ought to have a complete set of tools in his motor boat at all times. Opportunity for dealers. You can get such a set a little better and a little cheaper than elsewhere from Cell Drier Machine Company, Taunton, Mass.

WHAT DO YOU WANT FOR YOUR MOTOR BOAT? We make searchlights, castings, carburetor floats, bearings, lamps, horns, cut outs, dynamos, lighting fixtures. Write to us today for complete catalogue and price list of all our specialties. Fowler Lamp & Mfg. Co., 57 East 24th St., Chicago, Ill.

SUPERIOR OIL and Japan colors, stains, ready-mixed paints, wood fillers, varnishes and japans. If you want the best marine paints and varnishes try the Phoenix brand. Write us for literature. Phoenix Paint & Varnish Co., 124 Market St., Philadelphia, Pa.

Parts

AS LARGE MANUFACTURERS OF ENGINE AND VALVE SPRINGS we are pleased to announce that we have just contemplated an addition to our plant and installed new machinery which doubles our capacity. Sixty-six years of spring making only for particular manufacturers is a guarantee that "DUNBAR-QUALITY" represents spring perfection. The Dunbar Bros. Co., established 1845, Bristol, Conn.

THIS COMPANY was established in 1854 and incorporated in 1890, and is manufacturing marine engines, "Sheriffs" steam steering engines, and the well-known "Sheriffs" propeller wheels, which have been on the market for the past 35 years. We make propeller wheels of all sizes in cast iron, cast steel and bronze. We also do a general marine repair business. Sheriffs Mfg. Co., Milwaukee, Wis.

Cotton, Duck Canvas

LOWELL WEAVING CO., LOWELL, MASS., produces the finest Yacht Duck made in the world. Winning boats have used their duck from big cup defenders to the Sonner Klasse. Insist on having your sails made of Lowell Duck. "Special" for racing, "Regular" for cruising. Get the best and fastest duck.

Waterproof Cloth

FABRIKOID, BECAUSE OF ITS WATERPROOF and superb wearing qualities, and handsome appearance, is rapidly superceding canvas and leather for spray-hoods, side curtains, folding tops and cushion covers on the better grade of power boats. It is made in all colors by the Fabrikoid Works, Newburgh, N. Y.

Ignition

FAHNESTOCK SPRING BINDING POSTS OR connectors for all ignition wires around your boat. You have seen them on dry batteries. We make twenty different styles and sizes. Send fifty cents for a box of one dozen assorted sizes, or send for circular free. Fahnestock Electric Co., 129 Patchen Ave., Brooklyn, N. Y.

Boat Builders

KYLE & PURDY, INC., City Island, New York, have recently taken over the Robertson Yacht Building Plant at City Island, for the purpose of building steel and wooden yachts, repairing and overhauling. We also make a specialty of designing and constructing shallow draught steel launches and lighters from 25 feet up, for South American trade.

Motors

ACADIA GAS ENGINE CO., LTD., Bridgewater, Nova Scotia, manufacturers of gasoline engines especially designed for fishing and pleasure boats. These engines have been giving satisfaction and advertised themselves to such an extent that it has been found necessary to more than double the output of the factory each year.

Flag Poles

IN ADDITION to the Ajax and Protector Wind Shields and other automobile accessories made by the Novelty Manufacturing Company, Waterbury, Conn., they have added to their line a patented Flag Staff for motor boats, cuts and prices of which will be furnished on application to those interested.

Metal Stamping

METAL STAMPING for the motor boat industry. Metal goods of all kinds; drop-press and punch work; cold bending; engraving; steel stamps; letters and figures; die sinking, etc. Send today for literature. The Chandler Co., Inc., Springfield, Mass.

TO BUY OR TO SELL A BOAT

RACING OR CRUISING POWER BOATS, LAUNCHES, HOUSEBOATS, ROWBOATS, CANOES, ANY KIND OF CRAFT, ENGINES, ACCESSORIES, PARTS OF BOATS, ETC., TRY

MoToR BoatinG MARKET PLACE

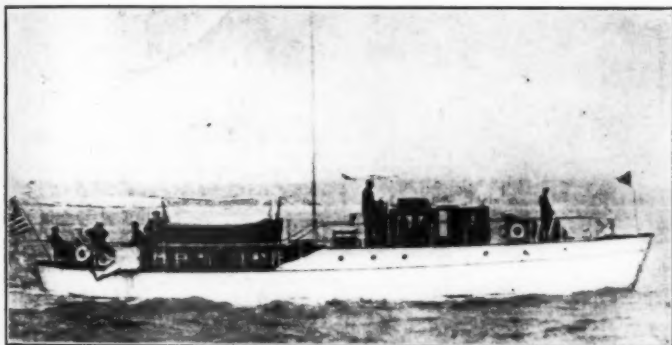
If you want an opportunity to buy something at a bargain—

A boat of any kind, from a racer to a cruiser, from a launch to an ocean-going power boat, or from a houseboat to an auxiliary;

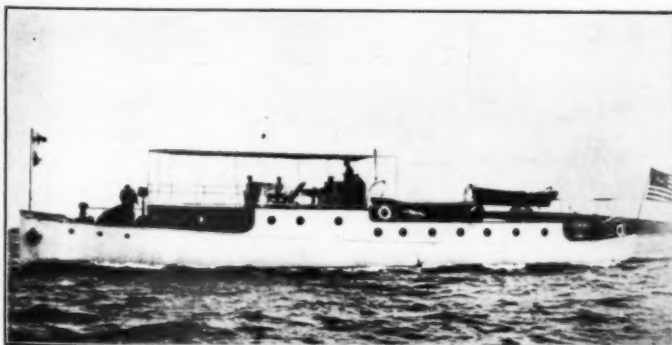
If you want to sell a boat of any kind; MoToR BoatinG's Classified Advertising Pages are where the opportunity hunters meet.

Today—now—publish your wants in the

OPPORTUNITY PAGES OF MoToR BoatinG



No. 1170.—For Sale or Charter. Unusually roomy 60 ft. twin screw power yacht. Speed 10-12 miles. Three staterooms, two saloons, etc. Handsomely finished and furnished. Cox & Stevens, 15 William St., New York.



No. 175.—Bargain, 86 ft. power yacht; A-1 condition. Very able; good accommodation. Speed 12-14 miles. Details from Cox & Stevens, 15 William St., New York.

FOR SALE—A \$2200.00 MOTOR BOAT FOR A PRICE OF \$1200.00

A Truscott 1911 model semi-speed, one man control, 28 ft. motor boat, double planking, mahogany natural wood finish both inside and out; just as good as new, run only two months. Equipped with 21 H.P. Truscott 2 cycle, 4 cylinder gasoline motor with dual ignition system; Kurtz high tension gear driven magneto and storage battery; Warner Gear Company auto steering wheel with spark and throttle control on wheel; Klaxon horn; Gray & Davis one-half mile electric search light; one extra 6 volt, 100 ampere storage battery for horn and search light; McClellan automobile top; four willow chairs with cushions; seating capacity, nine persons; all hardware trimmings nickel plated; speed 18 miles per hour; engine enclosed in forward cockpit, but started from operator's seat; factory selling price, equipped, \$2,200.00. For quick sale on account of change in plans will sell for \$1,200.00.

J. E. JOHNSON

MUNCIE, INDIANA

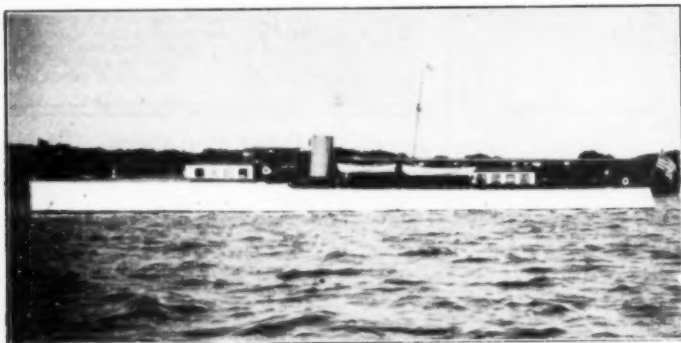
NO matter what you want to know about motor boats, their upkeep, running, parts or accessories, you will find what you want to know in the handsomely illustrated editorial pages of **MoToR BoatinG**. The advertising pages, just as important to the reader as the editorial pages, contain the first announcements of the leading manufacturers.

THE MOTOR BOATING MARKET PLACE

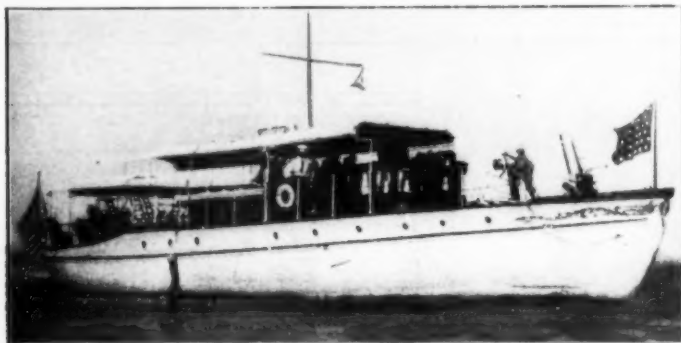
The rate for "For Sale" and "Want" advertisements is 3 cents per word. If an illustration is used the charge is as follows, which includes the making of the cut:
 Cut one inch deep, one column wide..... \$2
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Opportunities for the Motor Boatman

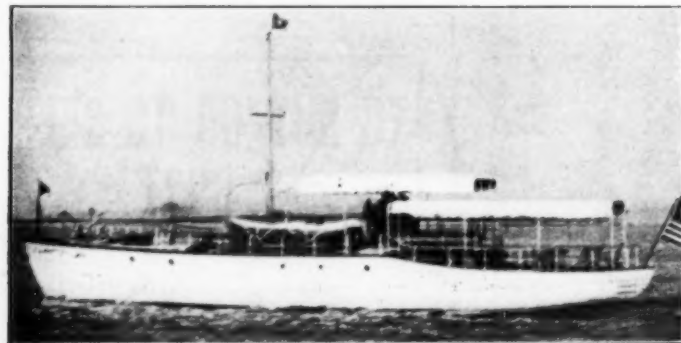
Before you buy or before you sell examine the exceptional buying and selling opportunities under this heading. They comprise the best offers of the month. Please mention Motor Boating.



3266.—Modern steam yacht; 135 ft.; lavishly furnished; 5 staterooms; 2 cabins; half cost; full particulars furnished. Whittelsey & Whittelsey, 11 Broadway, New York.



2804.—Modern Cruiser, 75 ft. x 15 ft.; Whittelsey design; Jacob build; Standard motor; 2 staterooms, large saloon, pilot house; electric light; full particulars. Whittelsey & Whittelsey, 11 Broadway, New York.



2596.—Sale or charter; 55 ft. x 12; raised deck cruiser; Standard motor, one man control; state room, large cabin. Whittelsey & Whittelsey, 11 Broadway, New York.

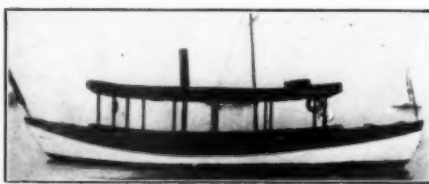


FOR SALE—Raised deck cabin launch, 28 ft. O. A., 7 ft. beam, self-bailing cockpit, 10 h. p. engine, is a fine sea boat, was launched last week in Aug., also new 20 ft. hull for power. William H. Chamberlain, Boat and Dory builder, 14 Orne St. Marblehead, Mass.

FOR SALE—Four-cycle, four-cylinder, 5 x 6, jump-spark engine, fully equipped; reverse gear; mechanical oiler; dynamo and storage battery for spark and lights; air compressor; used several months; guaranteed as good as new; too small for owner. Box 667, Charleston, S. C.

CHAPPELL & COATES, builders of boats—skiff, dory, launch, dinky or yawl. Agents as well of the best that they sell, in motors for autos, staid or marine, the Roberts and Syracuse, 2 cycle clippers, the wild Buffalo, say boys, she's a ripper. While the Perfection fits in between. Would you build your own boat? Then just drop us a note, as we are agents for the old Pioneer, the best one far and near. Chappell & Coates, Box 410, Port Townsend, Washington.

"CLASS"
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 The material, design, workmanship and accessories are all of the very best than can be procured.
 Light 6-30 \$450.00 Light 4-20 \$350.00
 Write for catalogue "B."
EASTERN MOTOR SALES CO.
 1680 Broadway, New York City.



FOR SALE—30 ft. 4 in. long, 8 ft. beam; whale boat type motor boat; speed about 9 miles; first class condition. Dr. J. H. Branth, 183 West 87th Street, New York.

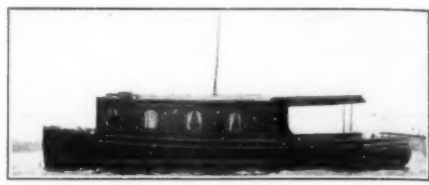
FOR SALE—Steam yacht, length 53 feet 3 inches. beam 11 feet 8 inches; 60 horse power, triple expansion Sullivan engine, new Army water tube boiler, perfect condition, cabin mahogany finish; cost originally, \$15,000.00; located at Jacksonville, Fla.; will sell cheap. Address W. A. Bours, Jacksonville, Fla.

FOR SALE—At half manufacturer's price, a few Martin air compressors, \$7 each. C. H. Martin, Norwood, N. Y.

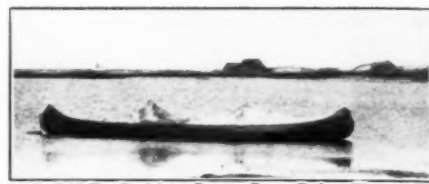
20 ft., 2 H. P. power canoe; built 1910; Schebler carburetor; perfect condition; cost \$260. What offer? Pitman, 316 West 93rd St., New York.

FOR SALE—Eight-oared lap strake barge, complete with spoon oars; will carry twenty-two people. A. E. Ward, Edgewater, N. J.

DIMELON'S ROCKAWAY PARK BOAT WORKS, foot of Thetus Ave., Rockaway Park, L. I.—Three new, specially designed ocean-going power dories, 21 ft. x 5 ft. 10 1/2 in.; finished with lockers, weathered oak decks, coamings and guard-rails; will install motors to suit purchasers. Second-hand Fay & Bower cabin launch, 22 x 5 1/2 ft.; 5 H. P.; 1910 model; complete inventory; a very pretty boat at a reasonable price.



FOR SALE—35 feet; 32 inches draft; 8 miles; 6 feet, 6 inches headroom; cabin; two double berths; galley; toilet; Wolverine motor; outfit; tender; built 1907; cheap; Philadelphia; No. 17, Motor Boating.



FOR SALE—Cruising Canoe Cape Cod. The greatest cruising canoe afloat. Shown anchored at Monoway Point, Cape Cod, after a run of over 200 miles through outside and ocean waters, from New York. 20 ft. by 3 ft., 2 cyl., 5 h. p. motor. Speed nearly 12 miles. Specially built, 1910. Used only three weeks. Full instructions in use by author of "From Novice to Pilot" to purchaser. George S. Goldie, New London, Conn.

BIG CASH AND PRIZE OFFER TO SUBSCRIPTION AGENTS

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Address C. W. PINNEY,
 10511 Amor Ave., Cleveland, O.

OWING to change of model of prominent marine engine builder, I have obtained remainder of unsold stock at a sacrifice; four cycle medium weight one and two and four cylinders. Some with reverse gears and propeller outfits. Will sell cheap. Also one 6 1/2 inch x 7 inch four cylinder Simplex Marine Engine with reverse and propeller outfit. Speculator, care Motor Boating.

TO EXCHANGE FOR MOTOR BOAT—Manufacturer offers two Canadian Patents covering article meeting with large sales in U. S. Excellent opportunity to establish light manufacturing business in Canada. Buyer will have co-operation and benefit of knowledge and experience of years to start business. Address B, care Motor Boating.

FOR SALE—Engines—75 new or used; 2 to 20 H. P.; marine or stationary; single or double cylinders; different makes; \$15.00 and up. Boats of all kinds at bargain. Big discount on new engines. R. M. Delagrange, Boat Broker, Stonington, Conn.

FOR SALE—Motor boat built by Kirk, Jones River, N. J.; 22 ft. 6 in. over all; 5 ft. 10 in. beam; draft 20 in.; 3 H. P. Globe engine (1907 model); hair cushions; spray hoods covering entire board; copper tank; brass trim; galvanized detached top; all in first class order; price \$500; cost \$850. Address J. W. H., Barnegat City, N. J.

LEARN at home, in a few evenings, how to construct, operate and repair Motor Boats, Motorcycles, Automobiles, Flying Machines, Gasoline Engines, Electric Motors, Commercial Trucks. Big demand, with good pay for competent men. Thousands of positions open. Let us help you in place and pay. A postal card will do. Address Extension Department, The Charles C. Thompson Co., 549 Wabash Ave., Chicago, Ill.

SEVERAL absolutely new Baldrige Reverse Gears, 1909 pattern; never unboxed; for engines of 5 to 30 H. P. Address A. G. Langworthy, 481 Wabash Ave., Chicago.

FOR SALE OR EXCHANGE—Miller Bros. 2-cylinder, 4-cycle, vertical Marine Engine and Equipments, 5 1/2 x 6 bore and stroke; bought last June; listed \$600; will take \$210 or will consider trade for more power for same or any good make of 4-cylinder, 4-cycle engine. A. Mathwig, Sioux, Nebr.

CRUISER FOR SALE—A well-equipped, 35-foot, raised-deck cruiser with 15 H. P. Mianus engine; speed 9 miles; toilet and fresh water; price \$1,500. F. W. Horenburger, 2000 Tribune Building, N. Y. C.

ONE 18-foot Launch, 3 H. P. motor, cushions and lights, \$135. One 21-foot Family Launch, 6 H. P. motor, cushions and lights, \$200. One new fast Runabout, 9 H. P. Lackawanna motor and reverse gear, \$250; will sell hull and motor separate. One 24-foot runabout, 15 H. P. motor, cushions and lights, \$300. One 28-foot Launch, 6-foot beam, 15 H. P. Ferro, cushions and lights, \$450. One 30-foot Family, 5 ft. beam, 10 H. P. Buffalo, all complete, \$500. None of the boats over two years old; all in No. 1 order and all bargains. Detroit River Boat & Oar Co., Wyandotte, Mich.

FOR SALE—Motor Boats Boat House, 23 x 5; 6 H. P. Boat, 15 H. P. Marine Engine, full equipment. H. J. Baldwin, New Baltimore, N. Y.

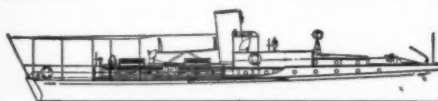
FOR SALE—Three 50 ft. cruising yachts; several launches. G. H. Miller, Patchogue, N. Y.

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SAGINAW, W. S., MICH.

Another Answer to the First Question.

COMPACTNESS, accessibility, economy in space and utility should be the aim and end in a housing for the motor in an open boat. I have used for several seasons the cross-seat arrangement of housing, an after-thought in my launch, and it has proved so satisfactory that others have thought worth while to engrave the idea. I evolved the housing from the "gurry" pen of the boats used by ocean fishermen to keep their fares from shifting, and from under foot. A similar compartment is used by lobstermen along the New England coast to keep the shellfish from knocking off their legs and claws after being taken from the traps.

Most small open motor boats have side seats running full length the cockpit, which arrangement greatly facilitates the installation of the housing to be copied from the fisherman's pen. These seats work in handy as supports for a cross-seat, really the top of the pen. A \$2 bill, a few tools and very little ingenuity ought to achieve results that need not be a bother. Go about it then after this fashion.

Screw 3 inch by $\frac{7}{8}$ inch pine cleats under the side seats at points abreast the motor's balance wheel and the exhaust manifold, leaving the ends of the cleats projecting about 1 inch into the cockpit to support thwartship bearing pieces 3 inches wide and thickness of the side seat which is likely $\frac{7}{8}$ inches. These cross-bearers fill the space between the side seats, making a foundation for the top of the housing. The cylinder of the motor may project a few inches above the bearers, or it may not, depending somewhat on the depth of the boat.

The cover for the housing should be made from $\frac{3}{4}$ inch pine board, cut to the length represented by the distance between the bearers, with 1 inch length added to each end, to which a lip is to be screwed to engage the bearers and prevent the top from shifting in a fore and aft direction. The top should fit against the edge of the side seats and be of width sufficient to extend within four or five inches of the cylinder. Cleat the under side of the board so it will not warp. When the boards are in place there will be an open space directly over the motor, giving access to the machinery without lifting the boards that form the rest of the housing's top.

If the cylinder head projects above the cover make a neat box to set over it, shutting in the opening. If the head of the cylinder is below the cover boards, insert another cleated board to fill the gap. The box may be hinged and padlocked while the middle board may be fastened in a similar manner. This top now gives a cross-seat about 20 inches wide with joints close enough to prevent spray from getting inside. A canvas cover, however, is a good thing when out in rainy weather.

Now for the ends that shut in the housing. They need be nothing more elaborate than the easily-slapped-together shift-boards of the "gurry" pen. Make the after end out of $\frac{3}{4}$ inch pine sheathing with a V-groove, if you like style. Cut the stock of such length that it will fit between the boat's floor boards and the under side of the bearing pieces and cleat the sheathing together for strength. Hook this partition to the bearing piece and to the floor—and there you are. For the forward partition make two sections, each fitting nicely to the round of the balance wheel with $\frac{3}{4}$ inch clearance to facilitate cranking. These should also be cleated and provided with hooks to keep them secure; the hooks on both fore and aft partitions to be inside where they cannot be tampered with unless the top is first lifted, which cannot be done under padlock without exercise of force and a stout crowbar. To keep the ends of the cross-bearers firmly in place I have found the common doorbolt, slipping into holes bored for it in the edges of the side seats, as good as anything. They cost five cents each, while the hooks and eyes for the partitions come three for five.

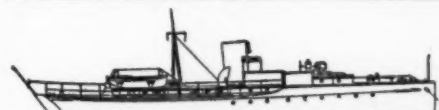
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Motor boatmen everywhere are daily pouring in inquiries about the mighty Columbia Marine Engine. These inquiries come from boat owners who want the best engine made. They come from hundreds who are planning or building their own boats. Take it from us—the Columbia Marine Engine is simply **breaking all records** in the hit it is making by the quiet, steady little way it has of **keeping at its work**—humming the happiest engine song of perfect performance that ever gladdened a veteran motor boatman's heart.

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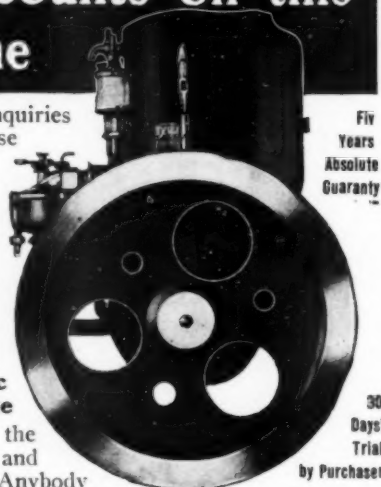
hours' notice. You can get all the business in sight.

And the Columbia sells at prices lower than those asked for ordinary engines. That's because we build them in such quantities. If there is no dealer near you, write us and we will tell you how you can obtain the Columbia. Write for special catalog number 10.

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(100)

Decks and Deck Arrangements.

(Continued from page 11.)

with the main deck. The cabin trunk is frequently retained on these larger boats in spite of its tendency to weaken the deck by cutting the carlins, even where not actually required for head room, because of its lighting and ventilating possibilities.

There is no doubt but that the stack, used primarily to satisfy our ideas of appearance, formed when all yachts were steam yachts, still has its uses. It affords ventilation high above flying spray and water and is frequently used as an exhaust outlet and receptacle for the mufflers. It is more decorative than actually useful though, and on the smaller craft where space and an unobstructed view are paramount, is therefore doomed. On schooner rigged yachts, where the masts and funnel may be given the same rake, the appearance is pleasing; but when used with a single signal vertically and not very far from amidships.

The tendency is away from excessive crown to the decks. A pronounced turtle deck forward undoubtedly does lend to the speedy appearance of the fast cruiser; and, by carrying the crown at the sides, a flat runway may be left from which the ground tackle may be handled. Even our pet vanities are doomed if impractical, and handling ground tackle on all fours on a highly crowned deck in a sea-way, will do much to normalize an exaggerated sense of the aesthetic.

Propeller Points and Problems.

(Continued from page 16.)

screw and of two co-axial, opposite rotating screws of equal total area operating under the same conditions. He utilized for the purpose a launch, of length 46 feet, beam 11¾ feet, and displacement 25 tons, so that his results, here tabulated, are of particular interest to designers of motor boats. The pitch of the contrary turning screws used was constant.

| Knots. | One screw, I.H.P. | | Two co-axial, contrary screws, I.H.P. | | Gain % based on single screw, I.H.P. | |
|--------|-------------------|--------|---------------------------------------|--------------|--------------------------------------|--------|
| | I.H.P. | I.H.P. | Extra friction loss. | I.H.P., net. | I.H.P. | I.H.P. |
| 5 | 6.3 | 5.45 | 1.09 | 4.36 | 30.5 | |
| 5½ | 8.3 | 7.32 | 1.46 | 5.86 | 29.4 | |
| 6 | 11.1 | 10 | 2 | 8 | 28 | |
| 6½ | 15.15 | 13.7 | 2.74 | 10.96 | 27 | |
| 7 | 21 | 19.2 | 3.84 | 15.36 | 26.8 | |

In his original paper, which appears in the Transactions of the Institute of Naval Architects for 1909 and from which the above figures are taken, Colonel Broda claims that so far as the reciprocal influence of the hull and propeller is concerned, his system is more efficient than a single screw:

(a) because the augmented resistance (thrust deduction) is less owing to the smaller screw diameters.

(b) because of the better utilization of the frictional wake.

In comparison with twin screws, there is:

(c) a reduction of bracket resistance,

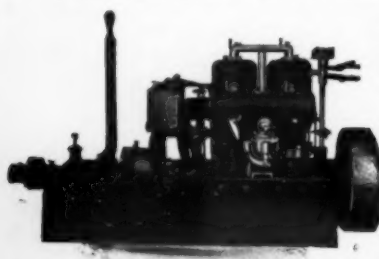
(d) better immersion.

Claims b and d seem to conflict for, as has been pointed out, the frictional wake is mostly at the surface. Claim c in the case of the motor boat does not amount to a great deal while so far as claim a is concerned it might be objected that smaller propeller diameters also lessen the sectional area of the propeller wake which, given the thrust, is a step in the wrong direction.

The fact is that with contrary turning screws or any other propeller innovation, theory counts for very little and practice for a great deal. If figures showing increased efficiency to anything approaching the extent of a saving of from 26 to 30 per cent of the motor output can be realized under normal conditions then, as Professor Greenhill predicts, we shall see Broda's, that is Ericsson's, system installed on everything afloat from the future ocean leviathan down to the humblest self-propelled canoe. It is noteworthy that the idea has already been put into practice on the Whitehead Automobile Torpedo.

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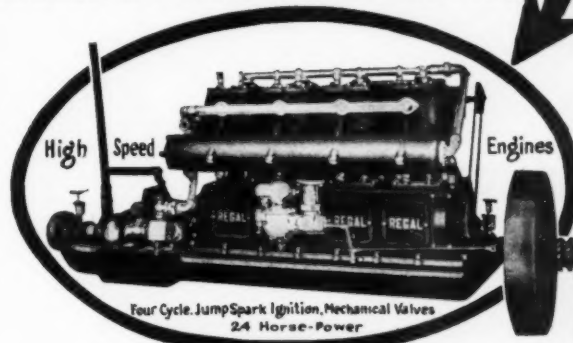
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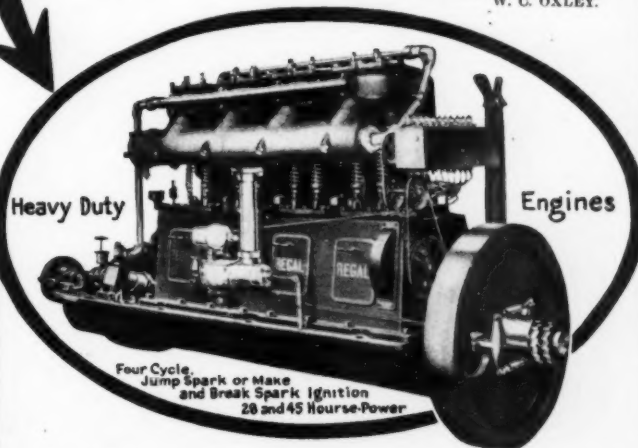
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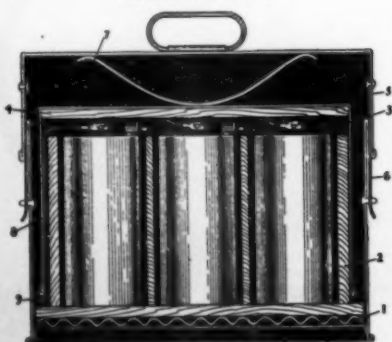
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It is not claimed for this box that it may be submerged without water entering it, but it does afford absolute protection from any amount of water that may descend upon it, and any amount of moisture that may collect below it; this is all that is necessary, for if a boat is submerged or going to sink, dry batteries will not help you.

Price \$4.75 each

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THE BECK COMPANY
Dept. N. Rockville Centre, N. Y.

Fitting Out.

(Continued from page 10).

ished, wash out all the fresh paint in kerosene or turpentine, shake the brush dry, wrap up in newspaper and your brush may then be put away for the coming year.

In mixing up the paint for the hull, a sufficient quantity of white lead should be worked up into a paste with a little raw linseed oil, and then thinned to proper brushing consistency with pure turpentine. For a first or priming coat for bare wood, enough paint to cover should be mixed up fairly thin with oil only. After this first coat has become thoroughly dry, brush on the second coat, using just a little oil and thinning largely with turpentine. This second, as well as the third or finishing coat, should be sufficiently thick to cover up well, yet working smoothly under the brush. It is of course impossible to secure a smooth, even painted surface by using heavy pigment, and the amateur painter should go to the extra trouble and brush on three moderately thin coats. When using ready mixed paints, the pigment must be thoroughly mixed with the oil by being well stirred with the paddle, and if too thick for easy brushing, thin with pure turpentine only.

After the top sides of the hull have been painted, the planking below the water line should be given a good coat of prepared copper or other anti-fouling paint. Commence by striking the water line with the edge of the brush and brush the copper out well. Owing to the fact that the copper or other mineral will quickly settle to the bottom of the pot, copper paint must be stirred at frequent intervals.

For painting decks, cabin tops, seats, and cock-pit floors, a light color paint is more serviceable and cheerful than a leaden grey or other dark shade, but this is, of course, merely a matter of personal taste. In mixing up the pigment for this kind of work, keg lead may be used for the base and any shade produced by adding the desired coloring material. Colors coming in the form of a paste are the best and strongest for this purpose, and the color should be worked up in turpentine and oil before it is added to the lead. Paint intended for hard wear should contain a larger quantity of oil, say about two-thirds raw linseed and one-third turpentine. Dryer is also sometimes used, but it is not really necessary for outside work as the natural drying properties of pure "turps" will be sufficient to form a good durable coating of paint.

Lubricating Systems.

(Continued from page 41.)

and again.

The great advantage of course claimed for the force feed system is that it can be piped to the most needed spot. This is true, but the ordinary splash system is also said to distribute the oil perfectly and there we have again a point which has been the cause of many a long and eloquent argument.

Before closing let us say one thing which may throw some light on a much talked of point. When taking down an engine using the force feed system, it has often been cited that there is a black streak down one side of the piston. Many say that this is caused by the fact that the oil has only been on one side of the piston and that the other side has worn away owing to the fact that it has not been properly lubricated. Let us remember that there are no perfect machines in existence for cutting an absolute circle. Both piston and cylinder are imperfect circles, although that imperfection may be only a fraction of a thousandth of an inch. The oil film fills the space between these two imperfect circles, but since the film is slightly thicker on the side of admission than on the other side, a minute opening is thus left down which the exploded gases are driven, leaving a carbon streak which is often taken for an indication of wear.

(Continued on page 78.)



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Will last for years

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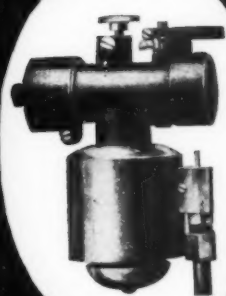
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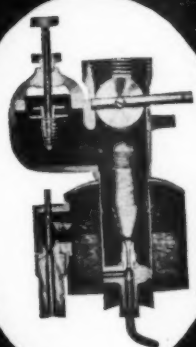


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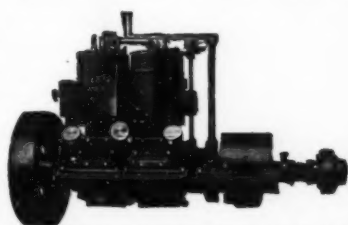
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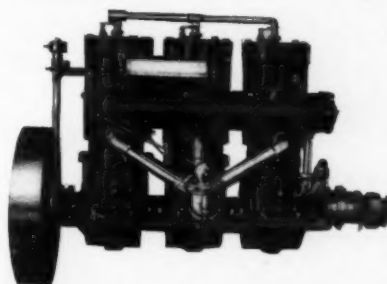
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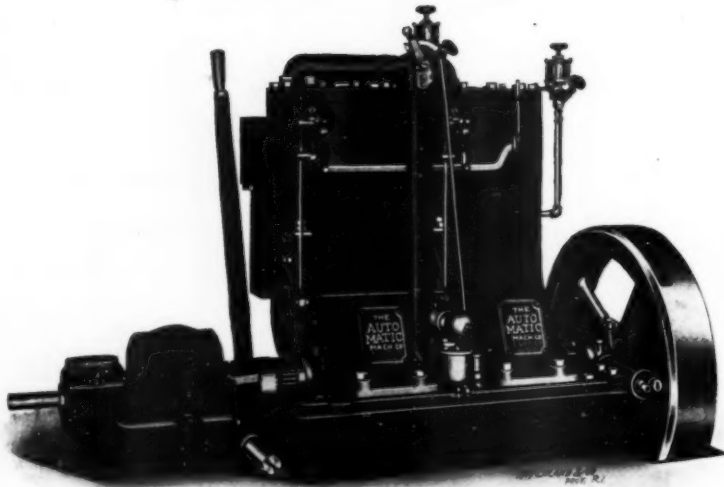
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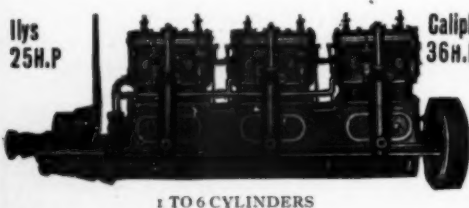
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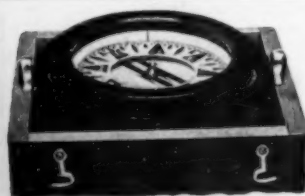
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Lubricating Systems.

(Continued from page 76.)

Too much oil, it must be remembered, is about as bad as too little. Oil contains carbon and a carbon deposit is easily formed when too much is being used.

This carbon deposit in the top of a cylinder will glow if it is thick enough, giving one of the chief causes of pre-ignition.

One of the best ways of detecting presence of too much lubricating material, is a light blue smoke which is emitted with the exhaust.

Other bearings are oiled by gravity oil cups, grease cups which screw down by hand and by the splash system. Many builders use a centrifugal ring for oiling their crank bearings. The oil flows to the outside of the ring by centrifugal force where there is a groove with a small duct. The ring is flat against the crank and as a duct in the crank registers with the duct in the ring the oil flows into this and by centrifugal force into the crank which is hollow. The crank is also perforated by a small hole on the top side which supplies oil to the bearing.

Charts and Their Use.

(Continued from page 33.)

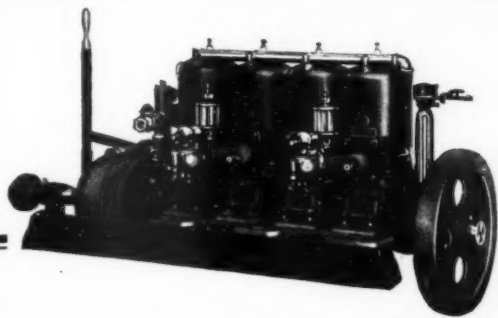
TO the United States Coast and Geodetic Survey the cruising motor boatman owes a debt of gratitude that can never be repaid. It matters not where his home port may be situated, for a nominal sum he can obtain Government charts of his local waters, and of any adjoining stretches of coast-line should he desire to voyage longer distances from his club moorings. And these charts are so wonderfully accurate that, notwithstanding the uncounted thousands of vessels that throng our waterways, it is a rare instance when a skipper succeeds in detecting an error upon one of them, even of the most trifling character.

Government charts are models of fine workmanship. Upon sheets of convenient size are plotted each section of our vast coast-line with every bay and headland, every rock and shoal, every buoy and light and beacon accurately drawn to scale, together with the topography of the adjacent shores, and the depth of water at countless points in feet or fathoms. There are large scale charts, showing in detail difficult pieces of intricate coast-line, and small scale charts covering longer distances, for those whose course lies well outside of the headlands.

In ascertaining a compass course one edge of the parallel ruler should be placed upon the pencil line of the course, and then the ruler should be extended, or, if necessary, stepped over to the nearest compass diagram, several of which appear on every chart. When the other edge of the parallel ruler passes through the center of the diagram the direction may be read at a glance and marked upon the course line in pencil for further reference. The chart before the helmsman should always be used in a position that will keep the compass bearings on the chart in line with the vessel's own course. For instance, if the vessel is proceeding S. W. place the chart so that S. W. on its compass diagram is in line with the boat's keel or her own compass. Then if a buoy shows on the chart far ahead and to starboard, the helmsman watches for the buoy to come into view off his starboard bow. Of course, the boat's own position on the chart must constantly be kept in the mind's eye.

The numerous soundings as marked upon the Government charts are only a few of thousands that have been taken, and these are closely spaced where necessary, but not so closely as to render the mass of figures confusing. In the white portions of the chart these figures denote fathoms (6 feet to a fathom), and in the shaded or shallow portions the figures are to be read in feet. The buoys are shown in their proper colors, and the character of lights and beacons is always indicated.

ALLAN O. GOOLD, Portland, Me.



No Service Too Difficult For T. & M. Engines

Consistent service is the keynote of T. & M. success. The design and construction of the T. & M. does not sacrifice durability to disproportionate speed or power—yet both power and speed are there *always* and in reserve. Every comparison will convince you that

T & M MARINE ENGINES

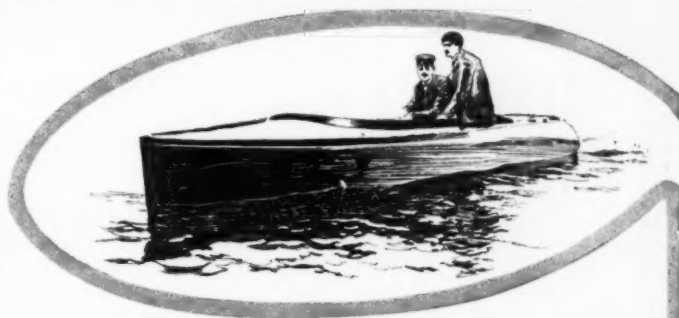
are rightly in the lead. The justly famous T. & M. 2-cycle—2 port type is built in all styles and sizes—2 to 120 h. p.—light, medium and heavy duty, single and multiple cylinder. The absolute dependability of T. & M. engines has held them in the lead for sixteen years.

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Termaat & Monahan Co.

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This Engine Lasts As Long As The Toughest Boat

THE "Perfection" is essentially the longest-lived marine motor built. It just thrives on hard work such as ferrying, towing or big pleasure jaunts and keeps at it year in and year out without a murmur. It needs hardly any attention. With a good flow of gasoline and a lively spark, it will keep working away at a great old rate and you can fold your arms, lay back and enjoy yourself.

"Perfection" Marine Motor

The "Perfection" is all its name implies right down to the most insignificant detail. It is simple and has comparatively few parts but every detail has been closely scrutinized and brought to a stage of perfection making improvement impossible. The "Perfection" therefore runs smoothly, is powerful and yet easy to operate. Any man, woman or child can run it without effort.

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We build "Perfections" in 2, 2½, 3½, 4, 6 and 8 H. P. in the single cylinder engines, also 7 to 30 H. P. in the 2, 3 and 4 cylinder engines.

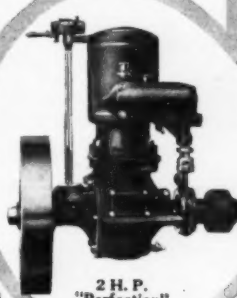
Prices range from \$40 to \$450 according to type and horsepower. Write for catalog.

Caille Perfection Motor Co.

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Sold for our Stationary Kerosene Engine Catalog if interested.
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2 H. P.
"Perfection"

Prest-O-Carbon Remover



**Cleans
Out Any
Gas Engine**

**Motor Boat, Automobile, Motorcycle
or Stationary.**

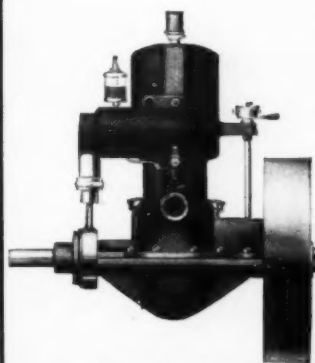
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Prest-O-Carbon Remover injected in the cylinder loosens and removes all carbon from cylinder walls, piston, piston rings and valves. Cleans a cylinder perfectly in an hour for 25 cents or less. Increases compression, power and durability. Has no effect whatever on metal—cannot injure the engine in any way. We guarantee this. Easy to use—directions on can.

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can any engine owner expect to get results with "bum" ignition equipment? No spark. No contact. Battery dry as "local option" town. Spark plug sooty as minstrel show. Just see yourself winding, winding that starting crank. Filling air with

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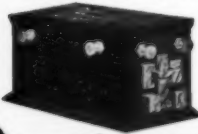
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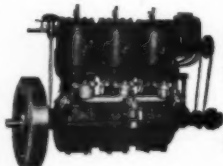
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Solid shank—no weakening hole. No pockets in head to bring mud to deck.

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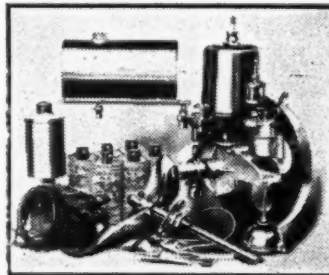
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Waterman Canoe Motors

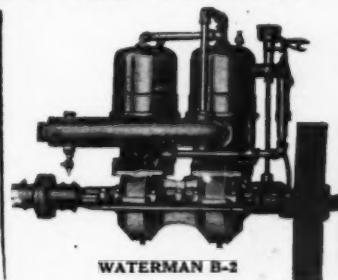


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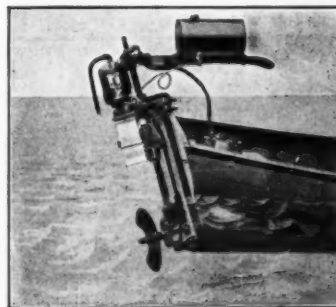
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6 HP single cylinder
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30 HP four cylinder
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ALL FOUR CYCLE

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100 HP six cylinder

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RIFFLEY'S KNOCKED DOWN ALL STEEL BOATS
Are made so simple any novice can set them up. Made 100 per cent. stronger than any other Wooden or Steel Motor Boat. All Steel Plates and Ribs are formed to neat design each piece punched and numbered. Boats complete also.



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Is superior in efficiency to any other on the market

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They work easier, last longer, and require less care than any other closets on the market.

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MOTOR BOAT FITTINGS

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The Seagoing "Gurnet" Dory and Semi-Speed Clipper Launch

Shallow Draught, Noiseless, Noncapsizable, Safe for Off-Shore Boating, Desirable Anywhere

16 to 30 feet

State requirements, and specifications of the boat desired will be mailed



A "Gurnet" Dory of coast of Maine

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Salesrooms: Boston, 83 Haverhill St. New York, 30 Church St.

FLAWLESS DIE CASTINGS

Made by Van Wagner

Thirty years' experience in

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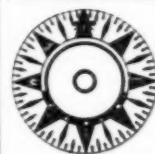
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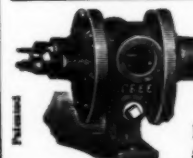
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Standard quality and absolutely reliable

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Automobile, Launch or Motor Boat use a LOBEE PUMP

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4 CYCLE ONLY

1 to 6 Cylinders. 5 to 40 H. P.

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Two Cycle, Single Cylinder, 1 1/2 H. P.

\$45 Complete with fresh water equipment. This is one of three splendid marine engines described in our 1911 booklet.

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Two, Three or Four Blade. For Speed Boats or General Service.



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STANLEY MARINE MOTOR

High in Quality Low in Price

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*It Simply
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of Order*

EUREKA TWO CYCLE SPECIAL CARBURETOR

*because —
it has NO Moving Parts*

no supplementary air, but at *all* speeds the air opening is proportionate to the gasoline intake opening and *this* WITHOUT THE AID OF VALVES OR OTHER MOVING PARTS. The Eureka Carburetor is not controlled by the usual throttle, but by means of the specially designed and exclusive Eureka piston throttle that regulates the air supply and gives wonderful flexibility at all speeds.

If your dealer cannot supply you with the Eureka, write us and we will send you illustrated descriptive price list.

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NEW YORK

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How much more satisfactory it is in every way to build your own boat. And among Boating People, boats built over **Pioneer Perfect Frames** are known not only as dependable, staunch and reliable, but as the most graceful in outline and as being in every sense seaworthy.

Thousands of the finest boats ever built are today in use all over the world and they were all made from Pioneer Knocked Down Frames and Plans.

You can save one-half the usual cost and own a better boat by using **Pioneer Perfect Frames**. You can do the work yourself or hire cheap, ordinary labor by our plan. This is guaranteed.

Pioneer Frames *Best on the Market*
Standard of the World

Made of first grade white oak; each one of these frames is set up and accurately trued at our plant before being knocked down for shipment. Every rib is bent to its exact position. You receive the frame in knocked down form, with each part marked for re-assembling. And the re-assembling is just A.B.C. play. No figuring to do—no strange mechanical terms to follow, just simply 1 2 3 instructions that anyone can follow. A wide choice of sizes and types—from sixteen footers to fifty. We also furnish planking—cut to fit—engine, etc., if you wish.

Dealers in boats and accessories and small boat builders will find it cheaper and much more satisfactory to order our frames instead of wasting their time and materials figuring out new patterns.

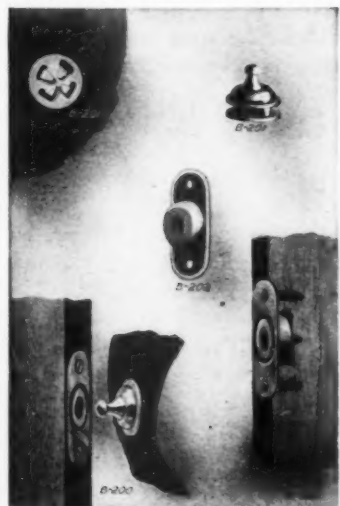
SEND FOR TABLE OF COST

This will prove how simple and easy it is to make your own boat and save one-half of what you thought you would have to pay. It shows all the types of 20th century motor boats, from a one-horsepower to a large ocean-going yacht. Write for a copy today. It tells the whole story in a way you can understand.

Pioneer Boat & Pattern Company
Wharf 24 BAY CITY, MICH



BROGA AUTOMATIC FASTENERS



Above cuts show design of special Motor Boat Curtain Fasteners that set flush with wood.

B-200—Shows the complete Broga Automatic Fastener

B-201—Shows method of securing fastener to goods. The stud has twin washers, one on each side of the goods, to prevent tearing out

B-202—The socket, front and back view. The front view shows method of fastening it to woodwork

For Motor-Boat Curtains, Slip Covers, Spray Hoods, Etc.

The only Fastener designed for Motor Boats; sets flush with wood, leaving no projections to be knocked off or damaged when approaching docks or other boats. They work automatically from any angle; add refinement and distinctiveness; are durable, and a sure lock.

Manufacturers, Jobbers or Consumers do not overlook the Ideal Equipment for Motor Boat Curtains. Write for Particulars and Free Sample.



A-100



A-100

FRONT AND BACK VIEW of "Broga" Automobile Curtain Fastener which is also used on "Motor Boat" Curtains, etc., with stud A-103 or A-105.



A-103

This form of stud is used for fastening goods to woodwork, etc.



A-105

This form of stud is used for fastening goods to goods.

BROGA AUTOMATIC FASTENER COMPANY
368 West Fayette Street SYRACUSE, NEW YORK

SIMMS MAGNETOS

A Reputation That Stands For Something
SIMMS Magnetos have earned the respect of motor boat users for invariable *Efficiency* and *Reliability* and every magneto we turn out is made with the sole idea of adding to this reputation.

THE SIMMS MOTOR STARTER is used in connection with the standard Simms Magneto and starts the motor without cranking.



THE SIMMS MAGNETO CO.

1780 Broadway, New York City

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ROEBLING

Steer Your Boat

with

ROEBLING LAUNCH
STEERING CABLE

A strong, pliable, durable and economical rope, consisting of a wire center, covered with high grade closely woven cotton yarn (not jute).

The center is made of thoroughly galvanized steel or *genuine bronze* wire as preferred.

The covering is furnished in standard colors and is treated with a waterproof compound.

If your dealer does not handle Roebling Cable, write to

John A. Roebling's Sons Co.

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Chicago, Cleveland, Philadelphia, Atlanta,
San Francisco, Los Angeles, Seattle, Portland, Ore.
John A. Roebling's Sons Co. of New York, N. Y.

Prompt shipments from stocks kept in the above named cities.

A
REVERSE
GEAR
IS THE
CONNECTING
LINK
BETWEEN
MOTOR
AND
MOTION

THE Motor Boat man using JOE'S IMPROVED MARINE REVERSING GEAR is always sure that a pull at the handle will cause his propeller to start, stop, or reverse, as desired.

He can be certain of this result because Joe's gear is sure and prompt acting, being built on correct principles.

It has but few parts, compactly and scientifically designed and constructed, and does not drag; but transmits to the propeller the full power and speed of the motor.

Joe's gears may be safely thrown to full speed in either direction without damage to the gears or motor.

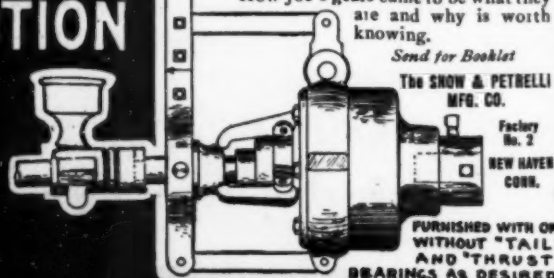
Motion is transmitted to the gears through a powerful eccentric which brings a uniform strain on all the gears.

The slow equalized gear motion insures long life and kills all noise and grumbling.

Joe's gears are strong, efficient, reliable and durable.

Investigate and compare them with others and you will take no other make.

How Joe's gears came to be what they are and why is worth knowing.



B & B

Speed Propeller

We are still making the same guarantee to increase the speed of your boat ONE TO THREE MILES PER HOUR, the same as we have done for the past five years. Don't be misled in trying a substitute, and experiment, but get the ORIGINAL.

Ask any launch-owner who has used one. They are the best wheel that has ever been put on the market, both as to design, finish and material that we use, making them the most expensive wheel to put on the market. Still our large sales do not warrant us in advancing prices, leaving prices as formerly, the lowest price and the best propeller wheel made. Write for catalogue containing a large number of testimonials from launch-owners getting the increase of speed which we guarantee.

We also make a complete line of Launch Fittings, Fog Bells, etc.

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The Yachtsman's Annual Guide and NAUTICAL CALENDAR

ESTABLISHED 1878

Contains over 300 pages full of instructions and information for Yachtsmen and Ship Officers and Motor Boat Owners. Among other things: Flags of Yacht Clubs, International Code of Signals, Storm Signals, Flags of Maritime Nations in Colors, Wig-wag, Yachting Etiquette, Laws Governing Yachts, Tide Calendar, Nautical Dictionary, Names of Spars, Rigging, Sails, etc., of different kinds of Yachts and Vessels (Illustrated), Rules of the Road at Sea, Water Routes New York to Chicago, Description of Harbors on the Atlantic Coast, Pilots and Charges, Tables of Bearings and Distances, New York to Halifax, Points of the Compass, Engineers' Signals, Buoys, Sailing Directions, New York to Eastport, Charts of Principal Harbors, Lakes, Canals, Directory of Yacht Clubs and Officers, etc.

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have puncture-proof hulls of steel plates and simply can't sink—have air chambers like life-boats.



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Illustrated in *colors*—gives full views, details, prices, etc., of this famous line. *Send* for it today. *Mullins Steel Boats* can't warp, waterlog, crack, split, dry out or open at the seams. Unlike wooden boats, they cannot leak. Can't be gnawed by worms. Have light, simple, powerful motors that won't stall at any speed—*start like an automobile* engine—ONE MAN CONTROL and famous Mullins Silent Under Water exhaust. *Twelve models, 16 to 26 ft., 3 to 30 horse-power \$115 up.* Carry more with comfort and safety than any other boats of their size.

Amazing prices this year. Investigate.

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The W. H. Mullins Co., 182 Franklin St., Salem, O.

11 ft. Dinghy—\$34



Complete Line of Row Boats and Duck Boats \$22 to \$39

EVERY MATTHEWS CRAFT A SUCCESS

THE boat which you built for me is a *grand success* in every sense of the word," says Chauncey Olcott, the famous actor and stage favorite to whom we delivered a 35-foot MATTHEWS runabout last fall, "and I am indebted to you for the personal interest you have taken in my boat."

"You promised 21 miles an hour and we are now making at Palm Beach over 25."

Can you beat it?

Service—that's the acid test. The MATTHEWS reputation is built upon it. Every MATTHEWS owner is a satisfied owner. Every MATTHEWS CRAFT is a grand success.

That is why THE MATTHEWS plant, even with its enormous facilities, can accept no more orders for cruising boats for summer delivery. We might deliver duplicates of Mr. Olcott's boat in one or two instances to quick buyers.

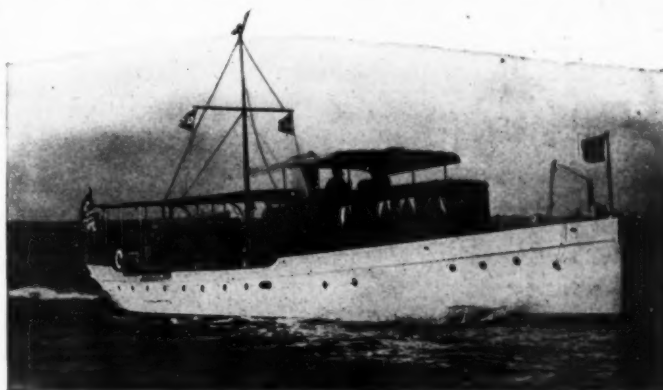
If you need a new cruiser for the trip South next fall now is the time to plan her construction. It takes time to build a MATTHEWS CRAFT and build it the way we build them. It takes time to work out the details of the designs so that every personal comfort is provided for and every individual desire of the discriminating owner gratified.

You can come to the MATTHEWS BOAT COMPANY and buy any kind of a boat any one can build and you are safe in experimenting with your ideas because absolute protection is assured. Whether it's speed, or comfort, or carrying capacity, or a conservative combination of all three, our plant is equipped to design and deliver the most up-to-date, high-class boats in the world.

Come to Port Clinton and see us and let us show you what's underneath the paint and varnish and why every MATTHEWS CRAFT makes good.

Come and see us.

THE MATTHEWS BOAT COMPANY
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35x14 Ft. Cruiser. Speed 14 1/2 Miles Per Hour

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Anyone who has had his motor start to "miss" when a gale was blowing, the sea heavy, or the tide against him, and has been confronted with the possibility of his engine ceasing operations altogether, knows how vital it is to have a cylinder oil that is especially adapted for use in marine motors.

Havoline Marine Motor Oils are *filtered*. They can be depended upon to keep down the carbon deposits as well as to lubricate.

Marine Motor Manufacturers advise the use of Havoline Marine Motor Oil. They know that Havoline will keep the motors clean and in perfect working order.

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Western Division
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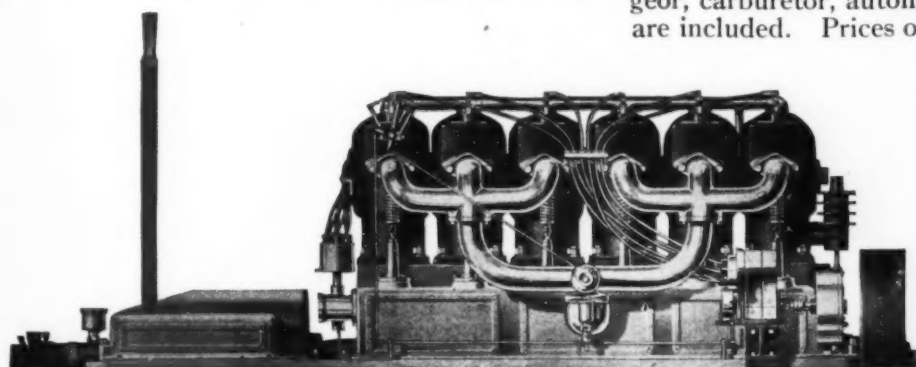
Best in design, equipment and dependability. Fulfills all requirements for both rugged power and for high speed.

THIS 6 CYLINDER LOEW VICTOR

Furnished with two separate systems of ignition, operating on two separate sets of spark plugs and deriving current from two separate sources. Battery and magneto, reverse gear, carburetor, automatic oiling system and air compressor are included. Prices on application.

Ask the man who has paid for his engine experience and finally found Loew Victor satisfaction—he knows.

Send for our engine information catalogue. Free on request and well worth having.

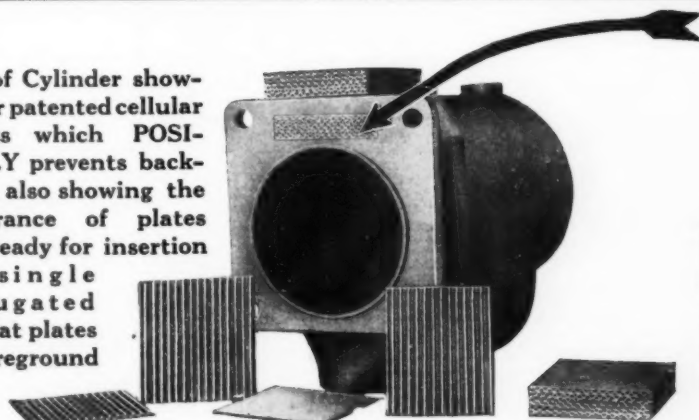


6 Cyl. 36-60 H. P. 4 3/4 x 5 1/4.

THE LOEW MFG. CO.

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View of Cylinder showing our patented cellular by-pass which POSITIVELY prevents back-firing, also showing the appearance of plates piled ready for insertion with single corrugated and flat plates in foreground



**THERE'S
THE REASON
THAT**

**Roberts Motors
NEVER BACKFIRE**

ROBERTS MOTORS are absolutely the only gasoline motors made that will NEVER backfire. This is accomplished by our patented CELLULAR BY-PASS shown above.

This BY-PASS accounts for the fact that Roberts Motors lead in FUEL ECONOMY, FLEXIBILITY OF CONTROL [may be throttled to two miles per hour, or opened to full speed without adjustment of carburetor] EASE OF STARTING, and SUSTAINMENT OF TORQUE AT ALL SPEEDS.

REMEMBER that this improvement is found in ROBERTS MOTORS ONLY. All ROBERTS MOTORS covered by our positive FIVE YEAR GUARANTEE. Made in nine sizes from 3 to 60 H. P., 1 to 6 cylinders.

Write for our complete catalog and price list—do it NOW.

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Which boat will go the faster?

has been painted with Bridgeport Standard (Mitchell's) Non-Fouling Enamel paint. You will note that there are no barnacles or seaweed on it; that it goes through the water smoothly, with nothing to retard its progress.

Bridgeport Standard (Mitchell's) Non-Fouling Enamel Paint

has been put on the bottom of the speediest boats in American and European waters.

The bottoms of three American boats, Harpoon, Beaver, and Cima, winners of the Spanish-American Sonder Class races, were painted with it.

The Interstate race of the "P" class boats between Massachusetts and New York, was won by Massachusetts boats, Amoret, Mavourneen and Timandra, all users of the Bridgeport Standard (Mitchell's) Non-Fouling Enamel Paint.

The winner of the Manhasset Cup for "P" Class, Cara Mia, had its bottom painted with this paint.

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Many testimonials are at your command from yachtsmen the world over—men with international reputations all of whom are ready to vouch for the superiority of Bridgeport Standard (Mitchell's) Non-Fouling Enamel Paint.

By giving some thought now to the painting of your boat, when Spring comes you can have the work done without delay, and be sure of a surface on the bottom of the boat that will produce results. We can help to increase the speed of your boat very materially at a very small cost to you. We will be pleased to give you further facts if you will write us.

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THE BRIDGEPORT WOOD FINISHING COMPANY

NEW MILFORD, CONN.

NEW YORK CHICAGO BOSTON



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**Every Thursday.
ONE PENNY.**

Published by: **TEMPLE PRESS Ltd.**
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DEALS exhaustively with every phase of the Sport and Industry, providing matter of interest and instruction to present and prospective owners of power craft, be they lovers of the stream, lake, tideway, or the open sea. It is profusely illustrated by working drawings in the technical section, and all important racing events are illustrated by photographs and sketches. There is no better journal for keeping one well informed on ALL questions pertaining to power craft. Its scope is unlimited—Advertisers in its pages receive enquiries and orders from all parts of the world.

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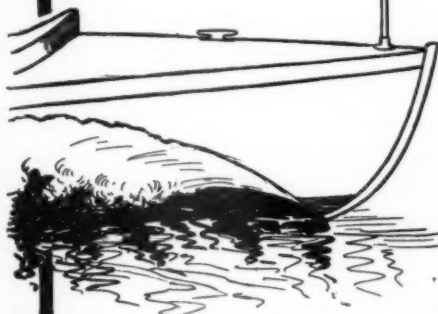
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The only British
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Tells all about the races our engines have won. Tells all about the excellent methods of manufacture. Tells why our "THELMA" four-stroke motors deliver more actual driving horsepower to the propeller for every drop of gasoline than any other engine. Tells about our GUARANTEE and our DIRECT SALES PLAN. OURS is the first high class 4-cylinder, 4-cycle engine ever sold direct to owners from the engine works. You save all agents and dealers profits. Prompt deliveries. Satisfaction guaranteed. The Thelma, first motor boat with a 4-cylinder "THELMA" engine ran OVER ONE HUNDRED MILES in four hours, and was ready to repeat the performance at the end of that time.

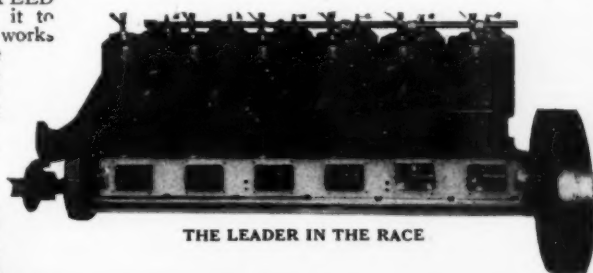
This Whirlwind Racing Engine

Is made in two sizes, 4-cylinders, 35 h.p. and six cylinders, 70 h.p. (heavy duty engines also if you want them, it's all in the free catalog). Our complete boat department will build you a speedy runabout or a fleet racing craft, install the engine and guarantee the speed or no sale. NAME THE SPEED you desire and we will give it to you. Our boat and engine works

turn out only the highest grade of material and workmanship, and we solicit the patronage of discriminating people who appreciate mechanical excellence. We build engines for speed boats, working boats, tow boats, cruisers, auxiliaries, torpedo boats and all types of craft requiring absolute reliability of power plant.

Our free engine book tells about races won and shows splendid illustrations of speed boats, engines and trophies. SEND FOR IT TODAY.

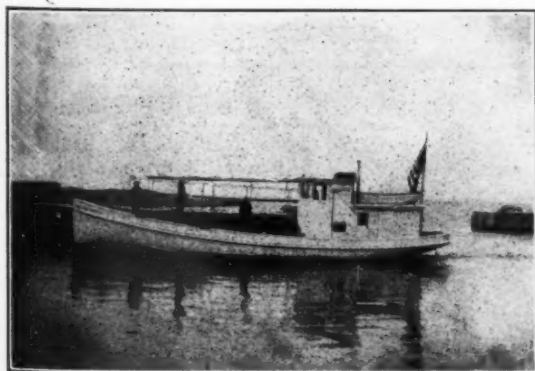
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270 Junction Ave., DETROIT, MICH.



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40 FT. LAUNCH FITTED WITH 16 H.P. GLOBE



50 FT. OYSTER DREDGE FITTED WITH 35 H.P. GLOBE

ON THE MARKET SINCE 1891

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THE REAL HEAVY DUTY ENGINE

FOR 20 YEARS THE ACKNOWLEDGED LEADER FOR

CRUISING YACHTS

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ELEVEN SIZES 2, 3 AND 4 CYLINDERS 16 TO 100 H.P.

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Complete Exhibit Chicago Office
DESIGNED by the best engineers in the country.
BUILT with the best of materials, and by expert
 shipbuilders, in an up-to-date shop.
FINISHED tastily and fitted out to your social
 needs; or, to your service requirements.

HANKSCRAFT COMPANY
 1112 South Michigan Ave. CHICAGO

Your Rowboat a Motorboat in a Minute

Enjoy the pleasure, comforts and convenience of motor boating without the high cost. Attach an Evinrude Rowboat Motor to the stern of your boat and go skimming over the water like a high priced power boat. It can be put on or taken off in a minute—fits round, square or pointed stern boats without alterations to boat and does away with tedious rowing entirely.

Evinrude Detachable Rowboat Motor

The engine is two-cycle—reversible—Speed up to 7 miles an hour—all exposed parts are made of highly polished bronze. Not affected by waves—spray, or salt. It is smooth running—clean—light—and free from vibration. Yachtsmen find it invaluable—an ideal outfit for automobilists. Anyone who uses a rowboat should have one. Can be carried in a canvas bag from one lake to another—engine and gasoline tank weigh only 32 lbs. It is thoroughly practical—reliable and lasting and absolutely guaranteed.

SPECIAL OFFER—WRITE!

Boat builders and agents write—we have a special proposition. Catalog with illustrations and descriptions of this marvelous detachable motor FREE on request.

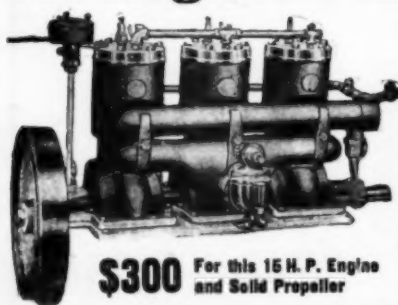
Evinrude Motor Company

215 Reed Street

Milwaukee, Wis.



Here Is An Engine Full of Speed



\$300 For this 15 H. P. Engine and Solid Propeller

will find the same unusual efficiency, economy and satisfaction. Write us for complete catalogue and terms.

Wonder Mfg. Co.

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You can always put clear water between your boat and another similar, if yours is equipped with this 15 H. P. three-cylinder wonder. And speed alone is not its only quality—it delivers more power for weight and rating than any other make of engine. It is lighter, yet stronger, simpler and more compact. It starts easily without "coaxing" and it keeps going until you stop it. Users state that it is the best, most efficient 15 H. P. engine on the market to-day. Like all our 15 models it is famous for its smooth and quiet running, and for its economy of fuel and oil.

GUARANTEED FOR 5 YEARS against any mechanical defect. Moreover, you will not have to continually tinker, fuss and readjust this engine. You will never find any engines more practically designed and highly satisfactory than ours. From the 2 H. P. to the big 75 H. P. you investigate our engines—write us to-day—better, do it now.

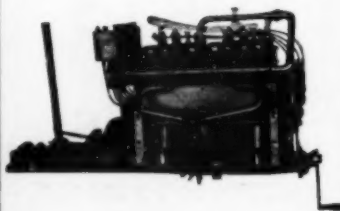
Splendid proposition for LIVE AGENTS

Have you sent for the 1911 catalog of

Heavy Duty MOTORS

We will have a new 2 cylinder 6 x 9 ready for delivery about May first.

THE HOLMES MOTOR CO., WEST MYSTIC, CONN.
 WE HAVE FINE FACILITIES FOR HAULING OUT

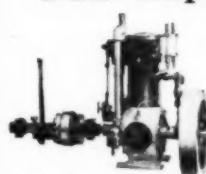


DON'T BUY "JUNK" when you can get "MIDGET" Class One LIGHTS

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| Height Eight Inches |  | Brass Bow and Stern for \$5.00 Set |  | Weight 5 lbs. Boxed |
| | Green | Red | White | |
| Makers of Marine Lamps, all kinds. Card brings booklet. | | | | |

PORTER CO., 194 Water Street, NEW YORK

Strelinger Marine Engines Built Expressly for Hard Service



For more than twelve years "THE STRELINGER," the old reliable 4-Cycle Marine Motor, has stood for the best in Marine Gasoline Engines. A distinct success. The most DURABLE, RELIABLE and ECONOMICAL Marine Motor made. The Engine that ALWAYS MAKES GOOD, because it is built right. Famous for ENDURANCE. Customer who bought the first Engine writes: "It is as good today as the day it was purchased. It always goes and never gives any trouble; have not spent a dollar for repairs." That is the Engine you want.

We also manufacture the "LITTLE GIANT" 2-Cycle Marine Motors. Customers who have used these Motors for the past seven years say, "They are the BEST 2-CYCLE GAS ENGINE MADE."

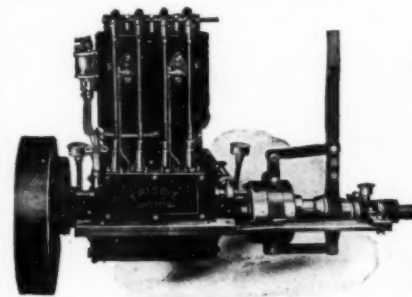
We can furnish you anything you want from 1½ H. P. upward, 2 or 4-Cycle, MARINE or STATIONARY. Send for our 1911 catalog, which tells you all that is new about Marine Motors; also how to avoid trouble and save money on your Marine Engine outfit.

THE STRELINGER MARINE ENGINE COMPANY
 MANUFACTURERS OF
 MARINE AND STATIONARY GAS ENGINES

171-173-175 Woodbridge St., West, Detroit, Michigan, U. S. A.

FRISBIE MOTORS

An iron-bound guarantee that safeguards you from loss goes with every Frisbie Motor sold.



Two Cylinder Frisbie Motor

The Frisbie Motor is made in one, two, four and six cylinders, ranging from three to EIGHTY horsepower—four cycle.

It is simple, having all valves in the head of the cylinder. That means power.

In materials and workmanship, as well as design, it is second to none.

WRITE FOR CATALOG TO-DAY

Frisbie Motor Co.

Middletown, Conn.

We Want Factory Making Launches

The demand for motor boats and launches all along the Gulf Coast is very great—the heavy freight rate which must be paid from north to the Gulf keeps many from buying who otherwise would. Therefore, your opportunity is here, making motor boats, launches and engines. Mobile is the best manufacturing point on the Gulf. Coal is cheapest here, and iron and steel come from the fields of Alabama at the lowest rates.

The market in Central and South America and Cuba reached by direct steamers from Mobile is great enough to take care of the output of two or three factories.

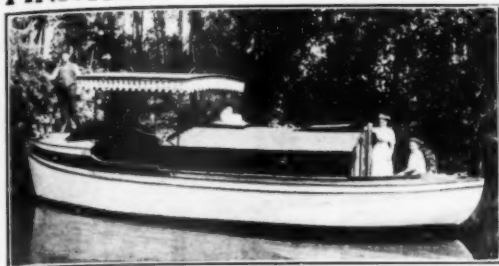
Let us send you our "Factory Facts and Figures." It will tell you a story of the great possibilities here. Your raw materials and your market are closest at hand—could you wish more?

MOBILE PROGRESSIVE ASSOCIATION
 Department "Z" MOBILE, ALA.

FINISHED

DEFOE BOATS

KNOCK-DOWN



COMPLETE FOR \$1600

Not a knock-down, but finished and either in the water, or on car at our factory. This price covers everything: electric lights, cushions, galley outfit—every last item of equipment that could be required.
Length 35 ft., beam 9 1/2 ft., draft 30 in., motor 3 cylinder, 4 cycle, heavy duty.
A floating summer home for eight people.
Write for special information on this boat.

BUILD YOUR OWN BOAT

A 45-FOOT CRUISER FRAME READY TO TAKE APART AND CRATE FOR SHIPMENT

We build both knocked down and completed boats of all sizes from the paddling canoe to the luxurious 70 ft. cruiser. Cabin cruisers are our specialty. Write us and we will convince you that other manufacturers cannot meet our prices on boats of this class, either finished or knock-down.

The superior excellence of our designs, beauty, seaworthiness and speed, and a square deal and popular prices to our customers have brought us in the past five years from a small and unknown factory to rank among the largest and best known builders of both knock-down and completed boats in the land.



You can buy this frame and complete from it a boat that will be a perfect summer home at a cost ranging from \$700 to \$1,000, depending upon the motor you install. This estimate covers everything except labor. Wealthy people buy these frames, and have them completed in their home towns. They can then watch every piece of timber that enters the construction, plan every detail of cabin arrangement, and after hiring all the work done save at least one-half on the cost. Our building instructions are complete and any one, experience in boat building unnecessary, can do the work. People of limited means buy them, do the work themselves and save three-fourths the cost. We sell cruiser frames from 35 ft. to 65 ft. in length.

Write for free catalog which tells the whole story

DEFOE BOAT & MOTOR WORKS, 3412 STATE STREET
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Down With High Priced Junk!

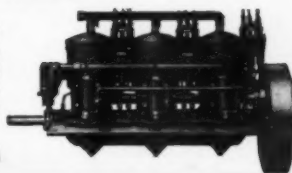
Why pay your good "IRON MEN" for "foundry work." GET YOUR WEATHER LAMP GLUED to the noise we are making in Detroit. Our ENGINE WORKS is crammed to the muzzle with "puff-puffs" already sold. It doesn't take long for the "smart folks" to cuddle up to a real engine proposition like the

ASTOUNDING DUBRIE

(The engine with the troubles left out)

JUST THINK OF IT! We will fit you out with a REAL three-cylinder engine jam-full-of over TWENTY HORSEPOWER for only \$200. Other engines as low as \$39.50 (we do not sell stripped engines). Has your brain absorbed the news? Are your feet on the narrow path and your fountain pen on the letter paper? All right. Send for our engine book TODAY. We are waiting for your letter. (New sales plan. Fine demonstrating outfit for new agents and in new territory.) "Wise" folks buy their two-cent stamps and send their letters quick. You?

DUBRIE MOTOR COMPANY, 137 Beaubien Street, Detroit, Michigan



This roomy, homelike houseboat

is now cruising in the most tortuous streams of Florida. Trim, speedy—makes 9 1/2 miles an hour—as responsive to the wheel as any motor boat, yet

The Cocopomelo *designed and constructed by us*

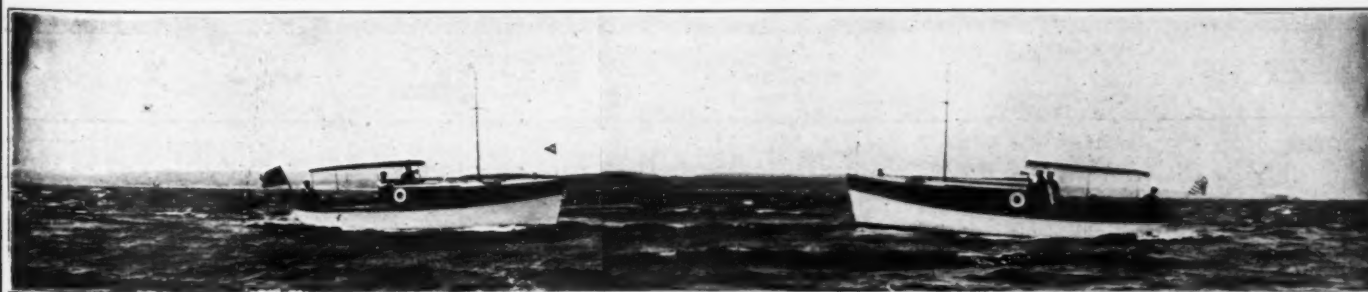
combines with this the enjoyment of all the social pleasures of hotel or bungalow.

We make yachts and motor boats along "better than usual" lines—have your architect send us your plans.

Write for our booklet. Tells how the unique tunnel construction permits the Cocopomelo to range the shallowest shoals—draught 18 inches.

MATHIS YACHT BUILDING CO.

Specialists in 60 to 100-ft. Cruisers and Houseboats
Cooper's Point Camden, N. J.



CABIN CRUISERS

Exceptional offers in the cruiser line. 35 ft., 38 ft., 42 ft., and 45 ft. Raised Deck type. These cruisers are equipped complete, ready for cruising at an extremely low price.

OPEN MOTOR BOATS

Bargains in all kinds of Family motor boats, shallow draft boats and runabouts. These boats are the very best the market affords and reasonable in price.

SPEED BOATS

Different types of speed and semi-speed boats are kept in stock. We can build you anything in the speed line desired.

COMMERCIAL BOATS

Tugs, Fish Boats, Small Passenger Craft or any special design of boat can be furnished. Let us figure on your new outfit.

YEARS OF EXPERIENCE HAVE TAUGHT US HOW TO BUILD AND EQUIP BOATS FOR EVERY REQUIREMENT

RACINE BOAT COMPANY

1615 RACINE STREET, RACINE, WISCONSIN U. S. A.
CHICAGO SHOW ROOM - 1508 MICHIGAN AVENUE

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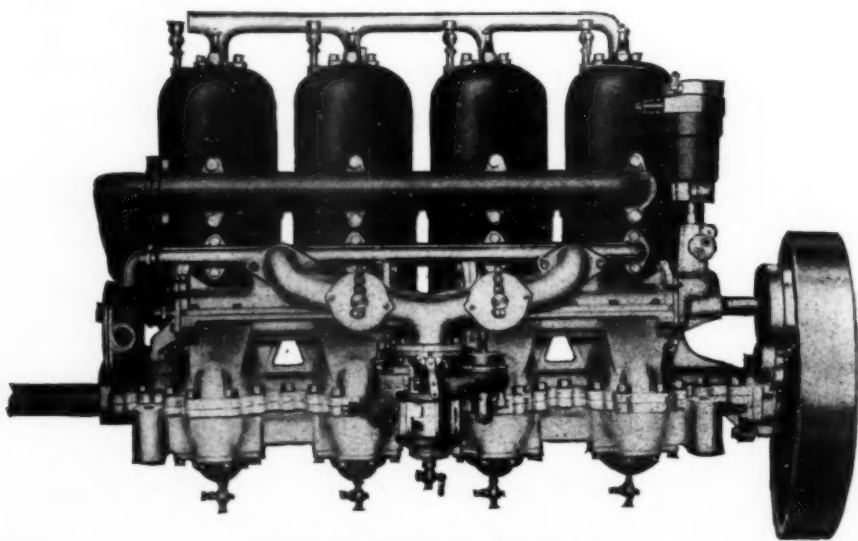
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Latest Improved Two Cycle TUTTLE MARINE ENGINE

AS MECHANICALLY AND THEORETICALLY CORRECT
AS ONLY 18 YEARS' EXPERIENCE CAN PRODUCE

Strong · Speedy · Steady · Satisfactory



Four Cylinder, 40 H. P.

Rotary Gas Intake Valve

Cylinders Offset on Driving Side

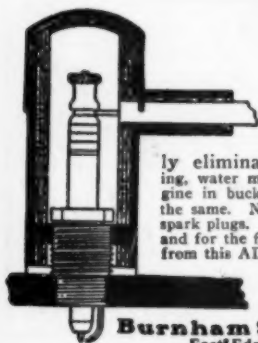
Two Opposed Liberal Exhaust Ports

Sizes: 2 Cyl. 20 H. P.; 4 Cyl. 40 H. P.

Novel control in 4 cyl. model permits alternate pairs of cylinders to run idle when full power is not required.

Write today for complete description

TUTTLE MOTOR CO., 542 Holden St., Canastota, N. Y.



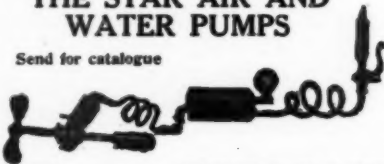
NOTICE

Here is just what you have been looking for. This Hooded Spark Plug will positively eliminate all short circuiting, water may be poured on the engine in buckets and it will run just the same. No more trouble with wet spark plugs. We want you to try one and for the first 100 inquiries received from this AD. we will send each, postpaid, an article worth \$1.50. NOW IS YOUR CHANCE.

Burnham Spark Plug Co.
East Edgecomb, Maine.

THE STAR AIR AND WATER PUMPS

Send for catalogue



W. & J. TIEBOUT

MARINE HARDWARE

No. 118 Chambers Street
NEW YORK

Send 4 cents postage for Marine Catalogue

"PYRMA" ALUMINUM MATTING

FOR

MOTOR BOAT FLOORS, COCK
PITS, STAIRWAYS, ETC.

IT DOES NOT TARNISH OR STAIN.
OIL, GREASE, ETC., DO NOT EFFECT IT.

9-10-12-14-15-18 and 20-inch widths, any length; or
sheets 24-30 and 36 inch x 84 inch.

Write for further information and samples.

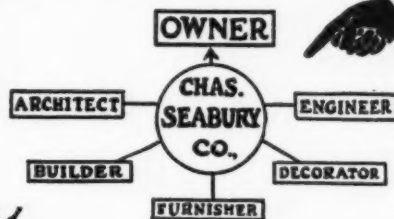
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CENTRALIZE RESPONSIBILITY

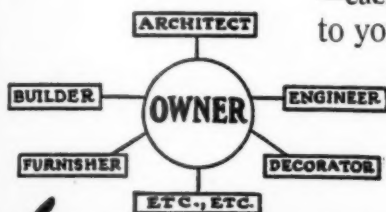
when you have your boat built



If you tell one concern that you want a boat built thus-and-so, and that you will hold that firm responsible for the product, you are sure of getting what you want down to the last detail.

But if you order an architect to design your boat, a boat builder to build the boat, an engineer to design or install the engine, etc., etc.

—each one is responsible to you for only the work he does.



DIVIDED RESPONSIBILITY MEANS THAT YOU CAN HOLD NO ONE RESPONSIBLE

Yet a mistake on the part of any one of them will spoil the whole boat—while the others will justifiably demand payment for the work they have done.

Centralize the responsibility. Go to the Gas Engine and Power Co. and Chas. L. Seabury, & Co., Consolidated, who can design, build, power, furnish and decorate your boat ready for immediate use, in their own plant—and who guarantee every detail as you want it.

What kind of a boat do you want?

For any kind, from a dinghy to an ocean going cruiser, consult with

GAS ENGINE AND POWER CO.

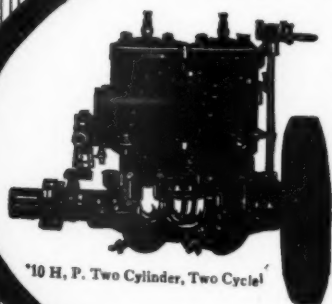
And CHAS. L. SEABURY & CO., Consolidated

MORRIS HEIGHTS, NEW YORK

EFFICIENCY RELIABILITY DURABILITY

"ERD" MARINE MOTORS

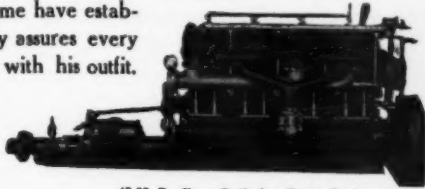
are well known throughout the whole world for their absolute reliability, perfect control, economy, accessibility and ease of starting.



"10 H. P. Two Cylinder, Two Cycle"

We manufacture both two and four-cycle Marine Motors of the highest quality that is possible to build a piece of high grade machinery. For fifteen years we have manufactured Marine Motors and in that time have established a reputation for quality which certainly assures every purchaser of an "ERD" perfect service with his outfit.

Write to-day for our finely illustrated and descriptive 1911 catalog completely describing "ERD" two and four-cycle Marine Motors. We want an opportunity to figure on your requirements as we know we can save you money on a Marine Motor for your boat when quality is taken into consideration.



40 H. P. Four Cylinder Four Cycle

ERD MOTOR COMPANY

Saginaw, Michigan, U. S. A.

MOTOR BOATING

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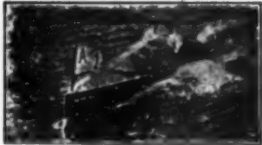
Judge an Engine and Boat By Its History

Don't buy an engine or a boat on promises.

Don't listen to talk about what the engine will do.
Find out what it has done.

Compare the actual History of the engine and boat
you thought best with that of the

ROCHESTER ENGINE AND BOATS



Find (if you can) an engine of corresponding price
whose record can equal the Rochester's.

For 12 years in every contest this engine has entered
it has proved its surprising quality.

"She seems to be proof against trouble." That's what
one racing owner says. You can't afford a faulty, "fussy"
engine. It spoils all the fun. Don't make a mistake.
Find out all about the Rochester engines and boats. Send
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1910 Models, one to six cylinders, 4 to 48 H. P. Im-
mediate deliveries. Mechanical oilers. Atwater Kent
Ignition. Gasolene or kerosene.

ROCHESTER GAS ENGINE CO.,

106 Platt St. and Brown's Race
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New York Agent,
928 Broadway,
N. Y. CITY.

"PYRENE" PUTS OUT ANY KIND OF FIRE



"WARNING."

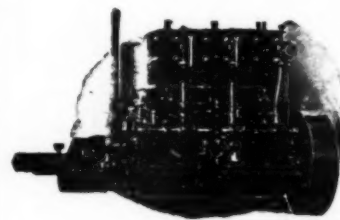
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selling or using, liquid fire extinguishers, of the
syringe type, or fire extinguishing solutions which
are broadly covered by U. S. Patents Nos.
866437, September 23d, 1907; 915917, March
23d, 1909; 954398, April 5th, 1910; and other
patent applications; also patents issued and pend-
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NOTICE.

Suit for infringement of our patent rights has
been brought against J. W. Durkee and C. D.
Durkee & Co., and we propose to take further
steps to protect our patent rights everywhere,
both as to users and sellers.

Pyrene Mfg. Co.

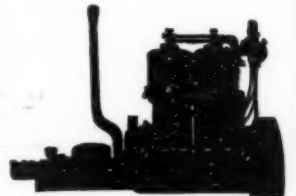
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Palmer Motors and Launches

Two and Four Cycle

One, Two and Four
Cylinder



Stationary and Marine
One to Thirty H. P.



Catalogue Free



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FanTimeR Ignition Apparatus

COMPRISES THE FOLLOWING PRODUCTS:

Fantimer, timer, one to six cylinders, plain and ball
bearing, for use with unit per cylinder, vibrating coils.

Fantimer, timer and distributor, one coil for any num-
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Fantimer, high potential arc magneto.

Fantimer magneto, using magnetic make-and-break
plugs.

Fantimer dual, using double set of plugs, one make-and-
break, the other jump spark.

Fantimer moulded insulation plugs, guaranteed for-
ever to neither crack nor leak.

Order a set of these plugs now, \$1.00 each, six for
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Fantimer products are built to sell on their merits, and
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All Fantimer products are protected by patents, allowed,
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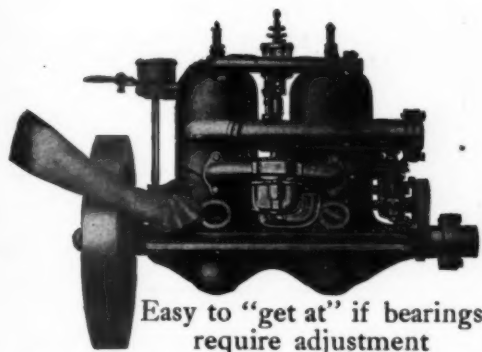
Remember all Fantimer Ignition Apparatus embodies
the two distinctive features, "A constant duration of
spark at all engine speeds," and "A positive automatic
advance."

Cuts not ready at time of going to press.

Fantimer Ignition Apparatus, Manufactured by

PAUL B. FANT
PITTSBURG, PA.

Make This Motor's Acquaintance —It Will Profit You



Easy to "get at" if bearings
require adjustment

Medium Speed Sizes.
1 cylinder—5 and 9 H. P.
2 cylinder—10 and 18 H. P.
3 cylinder—15 and 22 H. P.
4 cylinder—20 and 36 H. P.

Heavy Duty Sizes.
1 cylinder—3½ and 6 H. P.
2 cylinder—12 H. P.
3 cylinder—18 H. P.

Vim Motor

The Most Perfect Two-cycle Motor Made

If you power your boat, or buy a new boat this spring, without making the acquaintance of this Vim, you are overlooking the greatest value in the market—and by value we mean power, speed, economy, service and long life.

We have said, many times, that there is no motor in the world that can compare with the Extreme High Speed Vim.

That is as true today as when this type was new, and we'll tell you why:

To begin with, this Vim—though the speediest engine made in its various sizes—has all the strength and reliability of construction and the simplicity which have made the Vim line famous.

It has more power than any engine of like size, for we have solved the problem of getting more gas into the cylinders, and have patented our system of duplex carburetors and ports.

It is economical of fuel, for it returns power and speed for every atom of gas used.

It is built honestly and carefully, of honest materials, and has proved that it can "stand the racket" of the extraordinary demands to which a speed engine is invariably subjected; and one, two, or three seasons' use cannot rack it to pieces.

Vim motors are doing splendid service in many waters; but if you cannot easily come into close touch with a Vim owner, we will send you, on request, the voluntary expressions of men who are using the Vim, and the name of the nearest representative who can give you complete information about the entire Vim line.

The Vim Motor Company

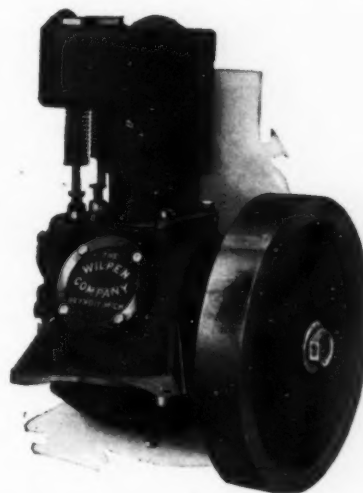
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The BRUSHMARINE 3-5 H. P.



THIS is the Marine type of the Brush Balanced single cylinder motor used on the Brush Runabout, the little Auto that, like the original "one lugger" Cadillac, also designed by Mr. A. P. Brush, "always runs and never wears out."

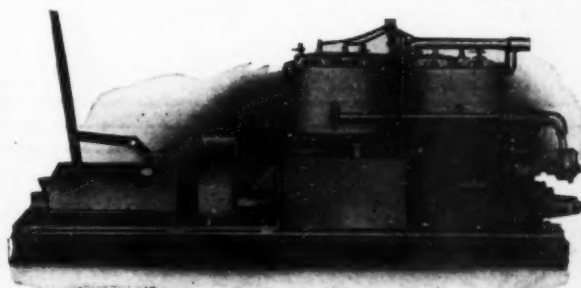
As little vibration as the ordinary two cylinder engine. Materials and workship just about as good as they can be.

For Reliability, Economy and Durability, it has no rival, and the price is reasonable.

Suitable for hulls from 16 to 25 ft. long.

Oakland
20-32

The RIGHT Motor



COMPACT

CLASSY

*Strongest Pulling Engine
of its inches in the World*

THE WILPEN CO.

100-110 Bates St.

Detroit, Mich.

If the **KRICE CARBURETOR** does not give you **20% more power and more economy** **RETURN IT AND GET YOUR MONEY BACK**

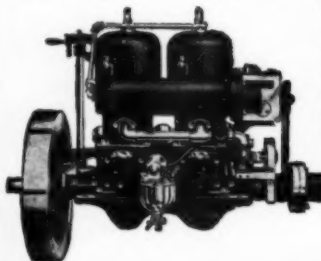
Specify it on your engine—you take no chances. We guarantee satisfaction

Krice Carburetor Co. Detroit, Mich.

NOT light enough to be freakish. Not heavy enough for ballast, but both light and heavy enough for good hard work in either a racing, pleasure or working boat. A common sense engine with material, workmanship and price to match. Simple and reliable. It is not necessary to be an engineer or mechanic to operate a L-A motor, for we



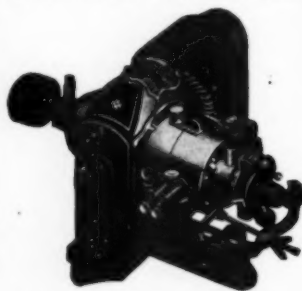
furnish all instructions necessary to install and operate; so the merest novice will experience no difficulty in setting up and operating. Our new catalogue is ready. May we send you a copy? It is jammed full of engine information, and free for the asking.



LOCKWOOD ASH MOTOR CO
Inc.

Jackson, Michigan.

INCREASE the POWER of your ENGINE—NO BATTERIES Needed



MOTSINGER AUTO-SPARKER

Will Generate Electricity for Ignition and Electric Lights, Charging Batteries, etc. Suitable for all types and sizes of Gasoline Engines.

Jump Sparker and Make and Break. Water and Dust Proof. Fully Guaranteed.

CHEAPER THAN BATTERIES

It will do for Your Engine what the High Tension Magneto is doing for the Automobile. Let us tell you how to make your own electricity for both ignition and lighting.

Free book gives complete details.

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Packard

CABLE

Always Inspires Confidence
BECAUSE
It Is Far Superior.

A USER SAYS: "I use Packard Cable for marine work and find it more than satisfactory. I shall specify it for my next year's boat. It is specially adapted for use under the decks where ordinary cable becomes useless in a few months."

Its much longer life makes **PACKARD CABLE THE CHEAPEST.**
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The Gordon Reversible Propeller

Practically a solid wheel with reversing virtues. No trappy parts outside the stuffing-box to become clogged when reversing. No loose noisy blades. Perfect control of boat at all times without touching engine. Blades adjusted instantly to any position—forward, back, neutral, "feathering" and intermediate.



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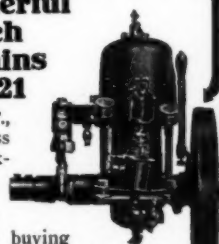
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SIDE LIGHTS

Before placing your order.

Our catalogue will also interest you as regards other Motor Boat Supplies, and our complete stock and prompt shipment will prove a satisfaction. Let us put your name on our mailing list.



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Cleveland, O.

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Cash Prices
on Anything
For the Motor Boat

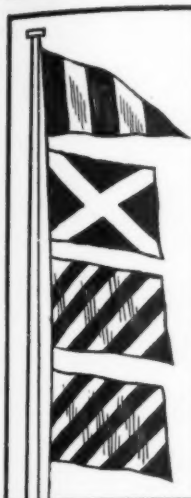


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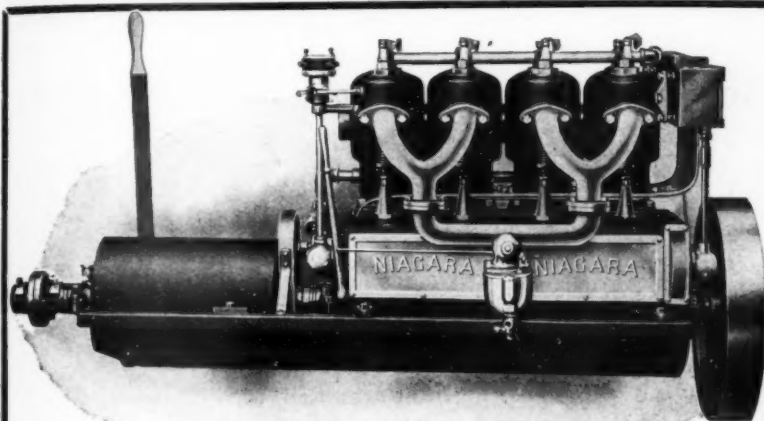


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 OR WHITE
BOTTOM COMPOSITION

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For the Bottom of Racing and Cruising Yachts and Launches
Absolutely Guaranteed

STEARNS & MCKAY MFG. CO. MARBLEHEAD, MASS.
 U. S. A.



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THE MOTOR OF QUALITY

Made in 2, 4 and 6 cylinders, 5 to 90 h.p., with short or long base, according to requirements, for

Cruising, Racing, Fishing, Freighting.

Every NIAGARA is fitted with mechanical force feed oiler, rotary or plunger pump and high tension dual magneto, if desired. NIAGARA crankshafts are hammer-forged out of 35 point carbon steel and have two bearings to every throw. The NIAGARA is recognized throughout the world as

Powerful, Dependable, Economical, Graceful.

It has no intricate, complicated or superfluous parts. Just motor, that's all.

Investigate. Better be sure than sorry.
 Send for catalog and Book of Evidence.

NIAGARA GASOLINE MOTOR CO., 194-200 Breckenridge St., Buffalo, N. Y., U. S. A.



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The Famous
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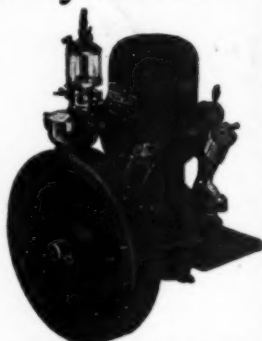
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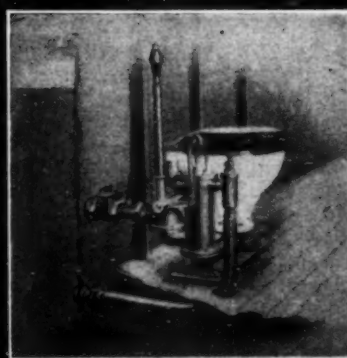
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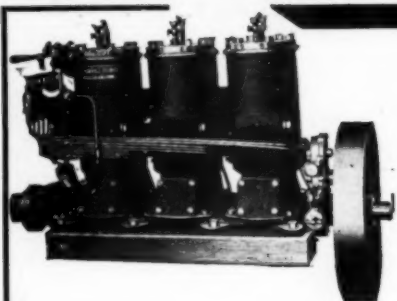
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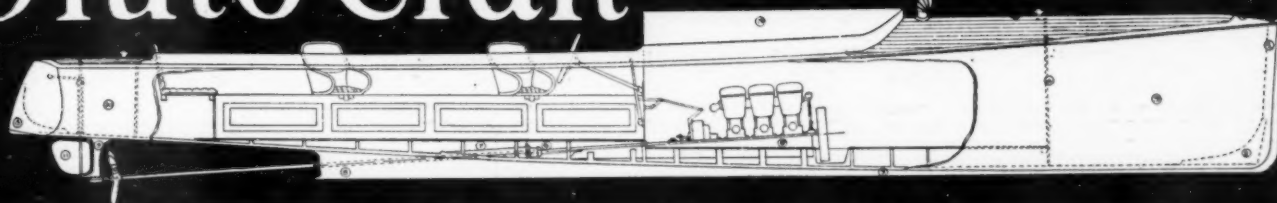
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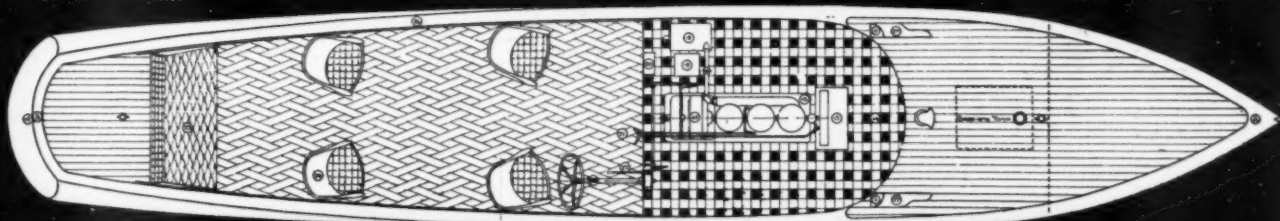
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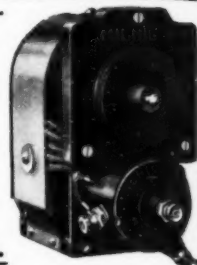
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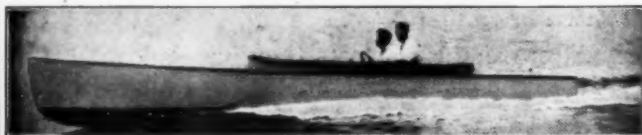
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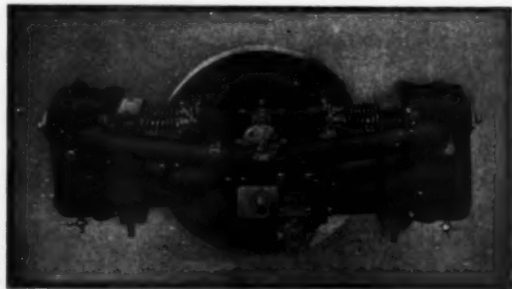
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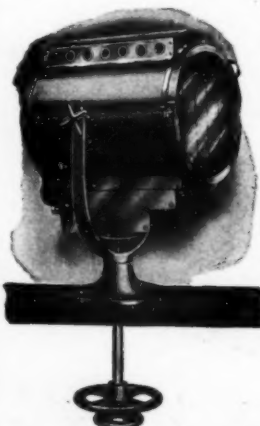
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Of the two cylinder opposed four cycle type. The Motor which is surprising the boat owners in every locality wherever introduced, on account of their compactness (can be placed under seat as so desired), economy of fuel consumption, non-vibrating qualities, and their perfect reliability. When supplied with a good spark and plenty of gasoline they will run until stopped. The owners of Beilfuss Motors are our best advertising medium. Why? Because they cannot say too much in their praise. Write for circulars describing our 1910 style motors. Thousands of unsolicited testimonials on file to prove the above claims. **Beilfuss Motor Co., 704 Saginaw St., E. Lansing, Mich.**



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Special Search Lights for Yachts and Power Boats

Can be used on the Smallest Launch or the Largest Steamship

All Sizes from 7 in. to 60 in.

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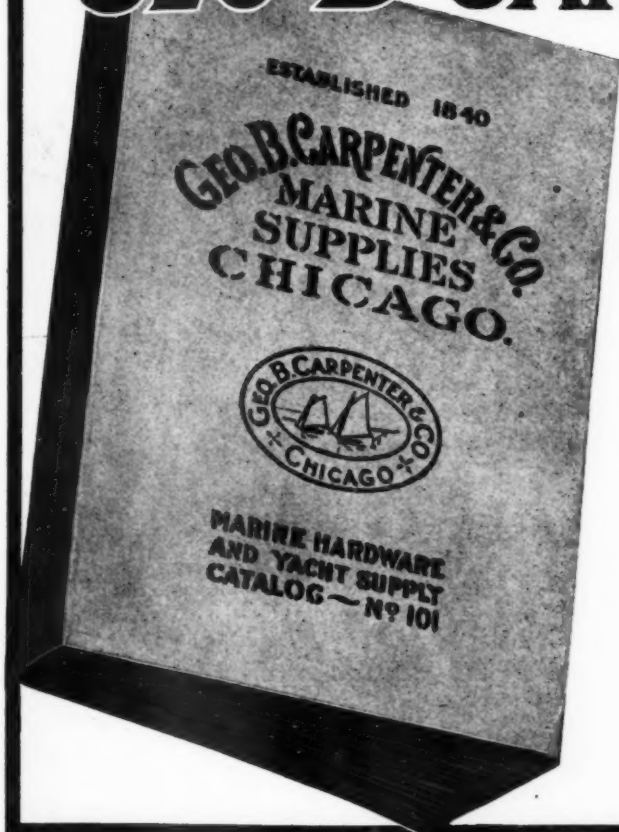
No. 101

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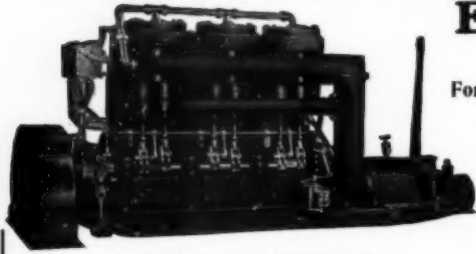


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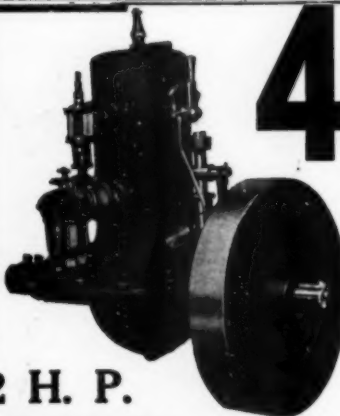
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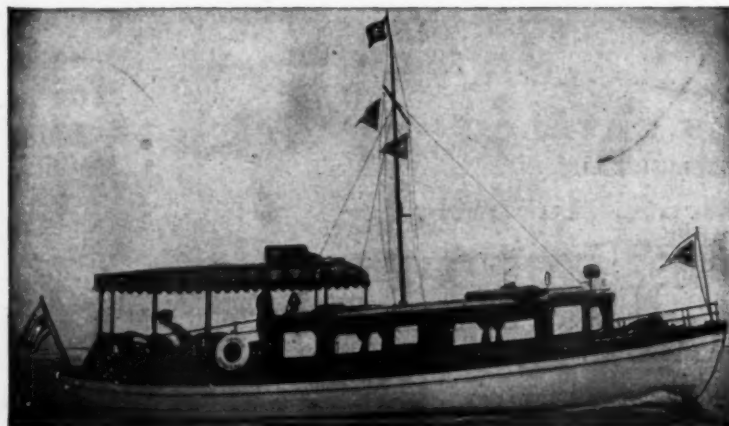
We have an especially attractive offer for boat builders and solicit inquiries from engine dealers.

Northwestern motors are used in Government Harbor Service and Chicago Police Boats.

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Will find it in our stock boats
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with a Roper equipped boat. With an ordinary propeller this man would, in many cases, smash into the float or strip his gears and stall his engine in reversing. With the Roper Safety Propeller he can *reverse* and *stop* in a boat's length—going at full speed, too.

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has more exclusive features than any other propelling device on the market. There's nothing else like it at any price. The Roper will double your power of control and the pleasure of running your boat.

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of difference in engines; good, bad and indifferent. Here's one that's "bully," does all you expect of it, and then some—clean running, smooth in operation, powerful in performance and consistent all the way through.

It's our four-cylinder Marine type—one of our newest and latest high-grade productions, up-to-date in every detail, standard in every respect, best investment you'll find for your engine-money.

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The only Top made that can be operated without detaching any part of the framework. [The one man Top]. You take no chances. There are times you cannot handle a Boat Top, unless made the McCLELLAN way. COST NO MORE. Think it over.

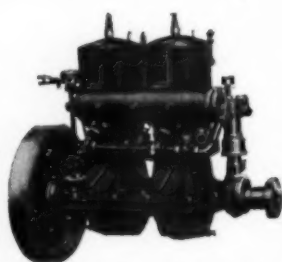
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Our top frames are all made of white oak with bronze metal fittings, Cover and Curtains, Genuine Government Khaki Standard. That means the Best.

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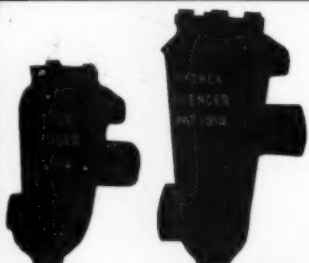
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The "LIBERTY" MARINE ENGINES is the perfected product of 22 years earnest endeavor.

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An Explosion Let Noiselessly Into the Air without Loss of Power or Efficiency

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Because metal is stronger and more durable than wood.

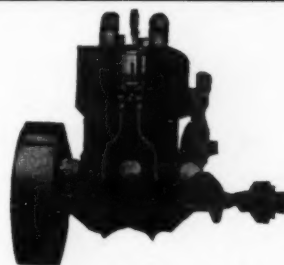
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are built for pleasure. They are puncture proof, rust proof and practically indestructible.

The Hyde System of Boat Building makes a perfect hull by a new process. If you are looking for beauty, speed and durability in your boat, investigate. Every Hyde owner is a satisfied owner.

Send to-day for Free Catalogue and complete information.

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Some 1911 Features

There Are Others
 Ignition—Perfex, Jump-Spark, Make-and-Break.
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This fine manufacturing plant provides one of the largest and most completely equipped plants in the East, devoted exclusively to the production of Lackawanna Valveless Motors. Since the Lackawanna motors were first put on the market we have contemplated such a proposition as this—a big factory located entirely among tidal waters and with shipping facilities of the best. For thirteen years we have kept on steadily growing and building, perfecting and succeeding with the one type. We originally put out, thirteen years ago, the first practical Three-Port Valveless design. We have put out many simplified improvements from time to time. Every Lackawanna motor turned out from the beginning was calculated to give good service and many of them even with a record of ten years or more use are giving active satisfaction today. Our new factory is located directly on the Hudson River with 1,000 feet of water frontage (twenty-five feet of water to dock) where Central Hudson Steamboats can land for freight, which, together with railroad switch along rear of factory, gives shipping facilities unsurpassed. The Lackawanna Motors for 1911 are being produced by the most modern equipment of machinery and brains that money can provide.

Lackawanna Valveless Motors for 1911

THE WORLD'S SIMPLEST—Built for Heavy Duty—Medium—or Speed Work
 No marine gasoline motor has fewer parts than the Lackawanna Valveless. None has better or more carefully machined and treated materials entering into its parts.

Anti-Cranking Feature—It's New The Double-Cylinder Model

Balances Impulses—Increases Power
 (They are fast supplanting the single cylinder motor.)
 The en-bloc, one-piece cylinder construction, results in increased efficiency, perfect cooling, economy of gasoline, freedom from vibration and long life. Our motors are Guaranteed.

Built in one, two, three, four and six cylinders, 2 to 45 Horse Power per motor, either jump or make-and-break low tension spark for battery or magneto; also electric light, pumping, refrigerating, and stationary motor plant. Prices, \$75.00 upwards.

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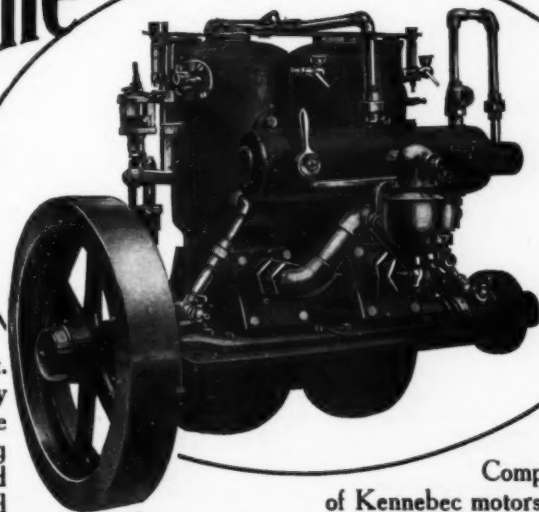
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Gasoline Engines are not "rough jewels"—they are "polished jewels" in every respect. They are sturdy enough for the severest working boat usage, and handsome and speedy enough for the finest pleasure boat.

Besides, in the Kennebec you get full-rated horsepower, plus a little bit more. Every Kennebec exceeds its rated horsepower by 30 to 40 per cent.

Compare the bores and strokes of Kennebec motors with those of any other marine engine of the same horsepower.

Kennebec, 1 cylinder: 2 H.P., 3 1/2" bore and 4" stroke; 3 H.P., 4 1/2" bore and 4 1/2" stroke; 5 H.P., 5" bore and 6" stroke.

Kennebec, 3 cylinder: 6 H.P., 3 1/2" bore and 4" stroke; 10 H.P., 4 1/2" bore and 4 1/2" stroke; 15 H.P., 5" bore and 6" stroke.

Kennebec, 2 cylinder: 4 H.P., 3 1/2" bore and 4" stroke; 6 H.P., 4 1/2" bore and 4 1/2" stroke; 10 H.P., 5" bore and 6" stroke.

Be sure to get horsepower for your money

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Supposing you bought a propeller wheel and you could not get any speed out of it, or a reverse gear that gave you all kinds of trouble. These things may not have cost you much and you thought you were saving money, but before you could get any pleasure out of boating you would have to get a new equipment.

Now, in selecting your wheels, reverse gears and marine hardware, get the best there is. The best is always the cheapest in the end. The Michigan line is a well-known standard line, the most complete and of the best quality. The prices are the lowest when you take into consideration quality, and when you buy the Michigan line you won't have to buy again.

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This company has been in business for ten years and is one of the leading concerns today, and supply over nine hundred Gas Engine and Boat Builders, and have thousands of customers that make a specialty of the marine line.

It will save you money to send for their large catalog and purchase the famous Michigan line of goods; they will guarantee you entire satisfaction.

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5 Years' Absolute Guaranty On this Wonderful Detroit Marine Engine

You Are the Only Judge of the engine and its merits. Material and workmanship guaranteed for five years.

Greatest Engine Bargain Ever Offered!

Fewest moving parts of any practical engine on the market. Rotating complicated or liable to get out of order. Only three moving parts. Extra long plastic white bronze bearings. Vanadium steel crankshaft. Adjustable steel connecting rod. All bearing surfaces ground. French gray iron castings. Water-proof lubrication system. Runs at any speed from trolling to racing.

Starts without cranking. Reversible while in motion. Perfectly counter-balanced. No vibration.

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Try the engine for 30 days. If you are not fully satisfied, return it and we will promptly refund all money paid us.

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THE RELIABLE WATER JACKETED COIL MUFFLER

For Gasoline Engines of All Kinds
Perfect in Operation—Simple in Construction

If you want to reduce the sound of your exhaust without offering any resistance to the flow of spent gases, and thus retain the full power of your engine, use The Reliable Water Jacketed Coil Muffler.

After experimenting for some time, and with many varieties of mufflers, we perfected the coil muffler, and believe it to be the best manufactured today.

The details of its construction form an interesting chapter in motor literature.

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For Pleasure and Working Boats. One to Four Cylinders. Three to Forty Horse Power. Write for Catalogue.

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Engines for All Purposes

Vertical and opposed four cycle,
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MR. BOATBUILDER:

Save 25 per cent. of labor cost of planking and decking on every smooth planked boat you build by using CUTLER'S PLANKING and DECKING CLAMP.

Prices: Large Size, \$4. per doz. Small Size, \$3. per doz. Send for Circular.

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are stiff, strong and durable because of their construction

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20th CENTURY MOTOR

Built in Sizes 12 to 300
H. P., 2 to 6 cylinders.

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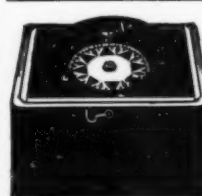
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As a Cut-Off Coupling

Clutch Drive. Small, compact and neat with all working parts enclosed. Particularly adapted to use in connection with Gas and Gasoline Motors, for any kind of work, to connect the Motor shaft to any other shaft. Send for our Catalog "R."

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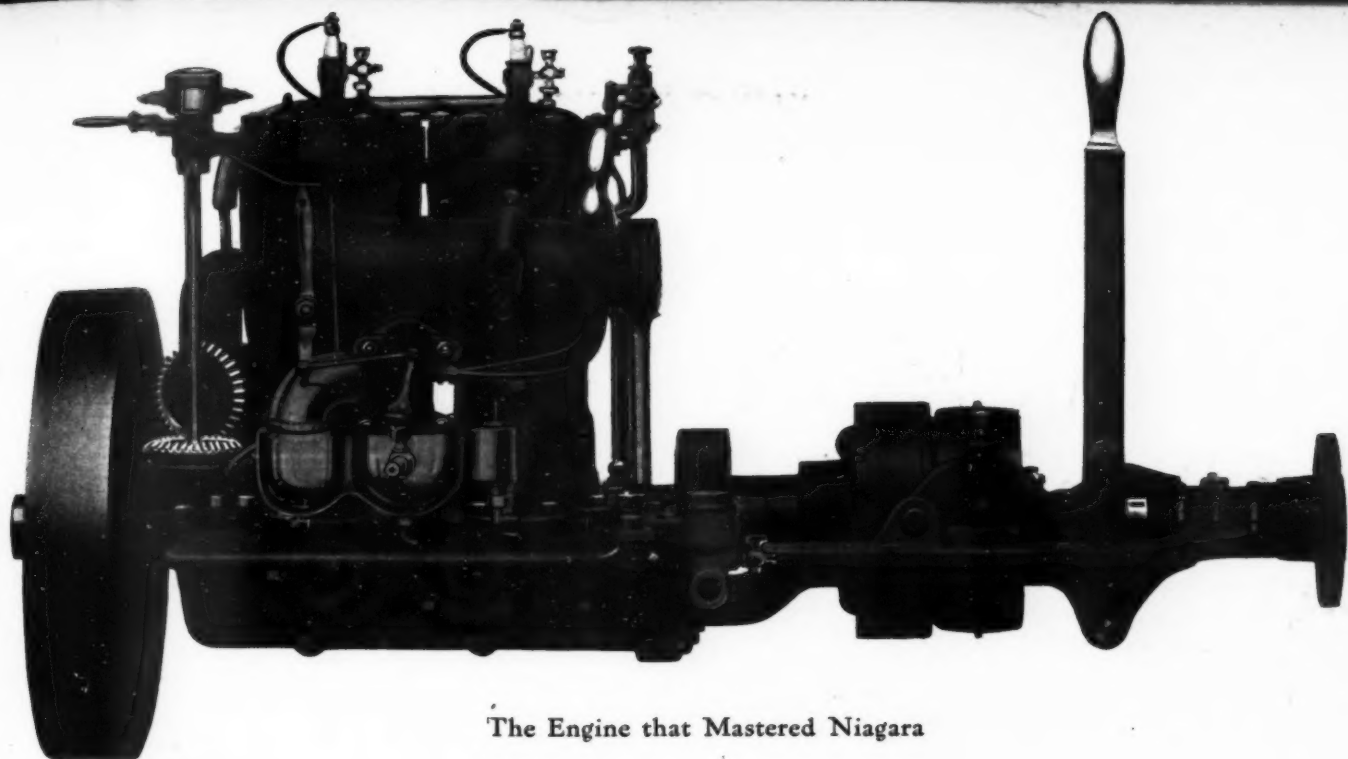
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The Engine that Mastered Niagara

FERRO MARINE MOTORS

THE WORLD'S STANDARD TWO-CYCLE BOAT MOTOR

The pleasure and service afforded by a motor boat, of necessity depends very largely upon the successful operation of the motor.

A high quality motor, like the Ferro, installed in your boat means that you can be sure of good results. The Ferro Motor has demonstrated its efficiency and reliability to more than 24,000 users in all parts of the world. Owing to its perfect design it will develop high power with minimum fuel consumption, and as it is made from the best of materials it will last for many seasons' hard and continuous service.

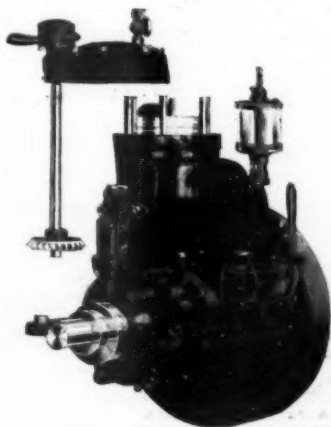
The Ferro Engine is particularly adapted to use by women and those who are not mechanically inclined. Being extremely simple and free from complicated working parts those without previous experience with gasoline engines have little difficulty in mastering it. At the same time it is so complete in every necessary detail that it is used as standard equipment by the largest and best boat builders throughout the country.

The 1911 Ferro Models embody two entirely new ideas in two-cycle marine engine building. The Ferro carburetor-timer-control for perfect control, and the application of the K-W high tension magneto for high efficiency motor ignition. The new 1911 catalog describes these features in detail.

Send for Free Ferro Catalog and Helpful Information on Boats and Engines.

It is impossible in this limited space to give even a slight idea of the advantages of the Ferro Motor. It requires 36 large catalog pages to do this adequately.

Every motor boatman should have a copy of the 1911 Ferro Catalog and Ferro Experience Booklet. If you are interested in the purchase of a boat or motor we will also give you expert advice on boats and engines and help you select the outfit best adapted to your particular requirements. This will not obligate you in the least to purchase a Ferro Motor. Write today. Address



Sectional phantom view of 3 H. P. Ferro Special

THE FERRO MACHINE & FOUNDRY CO. Largest Marine Engine Builders in the World.

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36 HUBBARD AVENUE

CLEVELAND, OHIO

Ferro Representatives in all Principal Cities and Ports.

MAIL THIS COUPON IN AN ENVELOPE TODAY

Ferro Machine & Foundry Co.
Cleveland, Ohio

Remarks:

Gentlemen:
Please send me copy of your 1911 catalog.

I am interested in a.....

H. P. engine, for boat.....ft.

long.....ft. beam, to seat

.....persons, speed,.....

miles.

Name



MODEL J

Guaranteed to start any Engine that you can crank over compression at the rate of 40 rev. per min. **Better than batteries.**

Why the K-W High Tension Magneto is superior to any other Magneto in the World

Because it is a complete ignition system all in one unit—**no coil, no timer, no batteries.**

Because it is guaranteed to start the engine on a quarter turn of the crank, even better than batteries.

Because it is sold on a 30 day, money-back-if-you-want-it guarantee, the safest insurance to you.

Because of its extreme simplicity of design and having nearly half less parts than any other High Tension Magneto.

Extreme simplicity means less parts to wear out, less parts to go wrong, and superior quality with less cost to the purchaser.

K-W High Tension Magnetos produce dynamic and not static sparks. Dynamic sparks give to an engine from 15% to 25% more power than static sparks, thus preventing the engine from carbonizing and fouling its spark plugs and effecting a great economy in gasoline consumption.

MAIL THIS COUPON IN AN ENVELOPE TODAY

K-W Ignition Co.
Cleveland, Ohio

Gentlemen:

Please send me your 1911 catalog.

I have aengine,cylinders,cycle,H. P. I cannot gear the High Tension Magneto.

Name

Address

Remarks:

MODEL J { 1 Cylinder - \$40.00
2, 3 and 4 " - 50.00
6 " - 55.00

We also manufacture larger High Tension Magnetos for larger engines.

Model H 4-magnet
Will start any engine up to 40 H. P. without batteries.

2, 3, 4-cylinder ... \$75.00
6-cylinder ... 85.00
8-cylinder ... 95.00

Model H T 5-magnet
Will start the largest engine without batteries.

2, 3, 4-cylinder ... \$ 85.00
6-cylinder ... 95.00
8-cylinder ... 105.00

The Model HT is the most powerful magneto made. It is the one used as standard equipment by several large stationary engine builders, and starts large 1,000 H. P., 150 pound compression engines with less than half the compressed air it takes to start on batteries,—no other Magneto is strong enough to start on its own power, but requires batteries. The largest marine engine is a mere pigmy compared to these large engines, thus demonstrating the hot K-W spark and ease of starting.

If you cannot gear drive a High Tension Magneto, use one of our Low Tension belt or friction drive Magnetos, and a K-W Spark Coil.

Low Tension Magneto \$35.00
Belt or Friction Drive
Used with K-W Coils
NO Moving Wires
NO Brushes. No Commutator
Runs in ball bearings

The K-W Spark Coil.
Single Marine Coils \$6.00 each
Coils with Cover \$7.00 each
Has its winding Guaranteed Forever against breakdown

See that Your Engine Has K-W Ignition or Get an Engine that Has

Stop your ignition trouble and you have stopped four-fifths of your engine trouble.

It's no use to tell you that dry cells and storage batteries are unreliable—you know that. Get a thoroughly reliable, up-to-date, K-W Magneto, and forget there ever was anything like ignition—the K-W Magneto will take care of that—we protect K-W ignition by the strongest guarantee on earth, write for copy.

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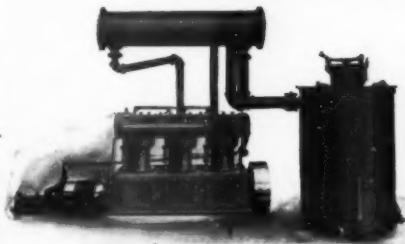


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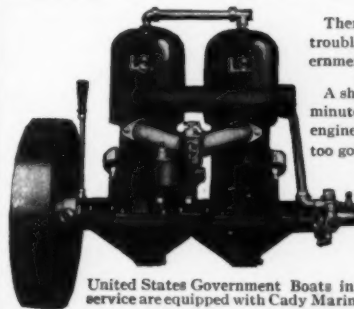
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**Double Chain
Side Draw
Saves Space**



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There can be no halts, no petty engine troubles, no guess work in boats in the Government service.

A shipwreck, human lives at stake, a mere minute spent in adjusting faulty spots in the engine and all may be lost. The best is not too good.

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United States Government Boats in the Navy, Life Saving and Lighthouse service are equipped with Cady Marine Motors. Write for detailed information

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Manufactured by

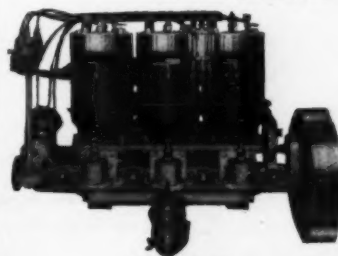
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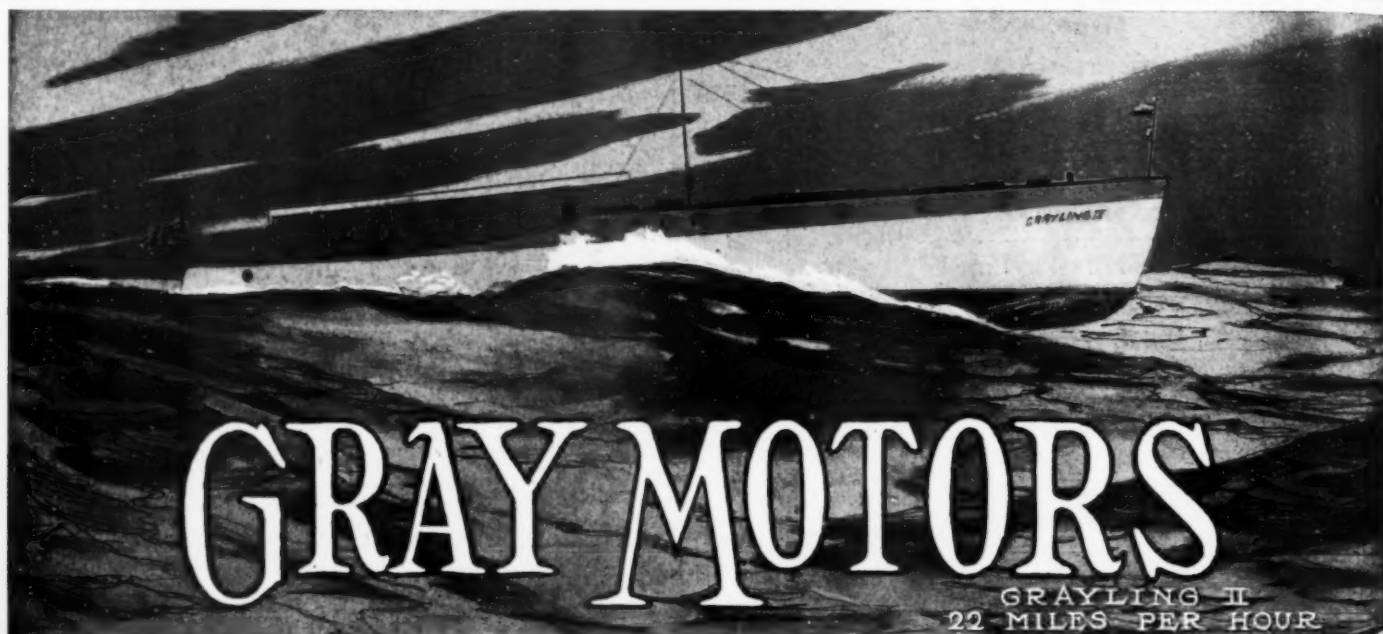
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C. FRANK MOORE
 220 Devonshire St., BOSTON
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Don't purchase until you have read in the *Brown Catalogue* what a really good motor consists of, made in sizes from one H. P., one cylinder, to 80 H. P. six cylinders.



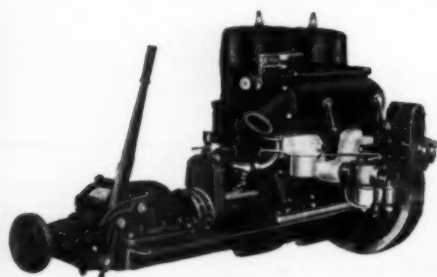
H. P. 30-40
 Write us today.



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GRAYLING II
22 MILES PER HOUR

For Large Cruisers, Pleasure Boats, Work Boats, Speed Boats and Canoes



The Engine That Requires No Attention

Equipped with BOSCH high tension ignition system.

We believe our Model "T" to be the highest type marine motor built.

We are prepared to furnish power plants up to 108 horse-power in our Model "T" line for either kerosene or gasoline fuel.

Made in one, two and three cylinder sizes—7 horse-power and upwards. Ask for figures on 36, 72 and 108 H. P. plants.

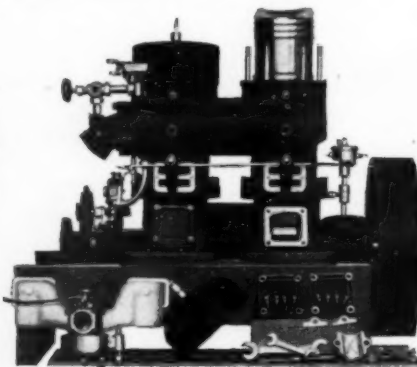
Perfect compression—starts on spark.

Three engines in one. Combination two and three port. Can be operated as a two port engine or a three port engine, or a combination of the two for high speed racing conditions.

No water pipes exposed.

Lubricates through gasoline.

Special Copper Gaskets most expensive and best Gaskets made.



Accessibility of the Model "T."

It took 14 minutes for an experienced man to disassemble the motor as you see it—the first time—it took less time to put it together again. He said he could do it a second time in 10 minutes.

Removable cylinder heads. (The most accessible engine built.)

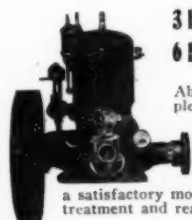
Cylinder can be removed without interfering with the bearings, exhaust manifold, gasoline or exhaust piping.

Pistons can be removed without removing the cylinder, simply taking off the cylinder head and remove two large hand hole plates on the side.

You know what accessibility means in a boat.

That's only one of the features of a Gray Model T.

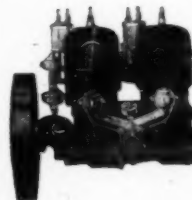
The same workmanship—The same quality of material—The same **STRONG** guarantee as our \$560 motor.



3 h. p. Guaranteed to develop 4 h. p. \$60
6 h. p. Guaranteed to develop 7 h. p. \$89.50

Above prices are for Complete Outfit.

The Big Plant—the splendid guarantee and equipment—the broad experience behind the Gray Motor insure you a satisfactory motor, prompt, business-like treatment and real motor satisfaction.



In a test by the Massachusetts Institute of Technology, this 12 horsepower Gray Motor developed 17½ horse-power.

12 horse-power complete outfit, ready to install in your boat. \$188

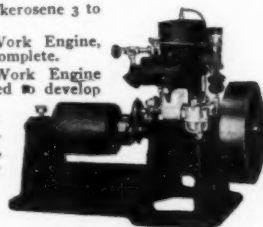
Gray Motors Equipped for general work and steady service

Gasoline or kerosene 3 to 36 H. P.

9 H. P. Work Engine, \$94 to \$124 complete.

3 H. P. Work Engine \$65, guaranteed to develop 4 H. P.

24 H. P. Irrigation Pumping Engine, \$346—36 H. P. for \$560.



Electric Light Unit

Motor and Generator on same basis. Complete electric light outfit for your boat or other purposes.

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Canadian Gray Motors, Ltd., 53 River Front Street Walkerville, Ont.

Big Stock of Motors in New York, Boston, Chicago, Milwaukee, Baltimore, New Orleans, Seattle, San Francisco, Philadelphia, Montreal, Cincinnati and Los Angeles.

If Your Boat Should Be
Sunk **Burned** **Wrecked**
in **to** **on**
Collision **Water's Edge** **The Rocks**

*Our policy covers against these losses and many others.
 Write for Sample Policy.*

Insurance Company
of North America

Walnut and Dock Streets, Philadelphia, Pa.

Capital, \$4,000,000

Founded 1792

Surplus to Policyholders, Over \$7,000,000

It costs but a few cents a day and may be worth hundreds of dollars to you

For use
 On Yachts, Steamships,
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The
"CHELSEA"

(Patent applied for)

Automatic Striking
SHIP'S BELL

The basis for operating is
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"CHELSEA"

Ship's Bell Clock

Outfitted with the (Patent applied for)
 electric attachment



On Yachts and Steamships, the big
 bell forward is operated by the
 "Chelsea" Striking Ship's Bell Clock,
 located in the cabin or pilot-house.
 The tongue of the bell is left free,
 so it can be operated by hand in fog.

Just what Yachtsmen
 Have been waiting for

PRICE LIST
 (Not including Clock)

For bell, relay, magnet, boxes,
 switch and wiring diagram.

Sizes stated are diameters of bells

| Size of Bell | Price List |
|--------------------|----------------|
| 5 3/4 inches . . . | \$75.00 |
| 6 3/4 " . . . | 80.00 |
| 8 1/2 " . . . | 90.00 |
| 10 1/4 " . . . | 100.00 |



To these Prices add the Price List of any size and style of "CHELSEA" Ship's Bell Clock intended to be used.

To parties purchasing any one of above outfits, we will outfit any "CHELSEA" Ship's Bell Clock now in use with the (patent applied for) electric attachment, free of charge, thus avoiding necessity of buying a new clock.

Any good electrician can complete the wiring and supply the batteries.

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 Marine, Ship's Bell, Mantel and Auto

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WATERPROOF LINEN, BRONZE CENTRE TILLER ROPE

This cord is patented by us. Patent Number 689,602.

Will Not Shrink, Stretch or Rust, and is Flexible.

OUR Tiller Rope is a combination of bronze wire and the best grade of flax yarn. It cannot shrink or stretch, will not rust, and is perfectly flexible. The ultimate cost is less than any other material used. It will outwear bare wire rope under almost any ordinary working conditions.

The flax yarn that we use as a covering is waterproofed before braiding, therefore insuring a waterproof cord throughout, and is impervious to weather. The bronze centre is made under a special analysis and we know that this will give greater service than anything used for the same purposes under similar exacting conditions.

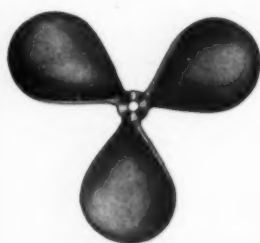
Made in Sizes $\frac{1}{4}$, $\frac{5}{16}$, and $\frac{3}{8}$ Inch Diameter. Put up in Coils of 1,000 feet each.

If you cannot obtain our Tiller Rope from your dealer let us know and we will mail samples, quote prices and furnish any and all information desired. We are also manufacturers of all lines of Cordage, Special Manila Yacht Rigging, etc.

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 FACTORIES: Tuckertown Mill, Tuckertown, N. C. New London Mill, New London, N. C.

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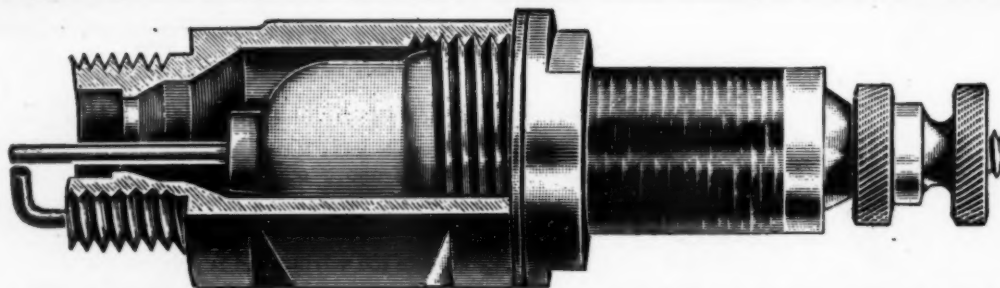


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Why have your Automobile or Boat cumbered with an expensive magneto and gas lighting outfit when you can buy a moderate priced magneto of us that will answer both purposes? Write for particulars. Remember also that we still set the pace with our Standard Magnetos for Stationary or Marine Engines

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SOOTLESS

"SANDS" MARINE SANITARY FIXTURES

Their mechanical perfection and artistic design prove their superiority



PLATE S-28

The "Manor" Pump Water Closet with improved high-grade 4-inch combined supply and waste pump, oval pedestal, Vitro-Adamant bowl, polished quartered oak seat and cover, automatic safety water supply foot valve.

Complete mahogany seat and cover \$100.00

add \$2.00

This closet is a recently designed fixture made especially for an easy acting pump closet discharging contents quickly. Bowl has straight back and back outlet. The pump has a 4-inch cylinder, well-vented and self-closing foot valve. This special foot valve insures a positive control of the water supply and guarantees safety. For use above or below water line.

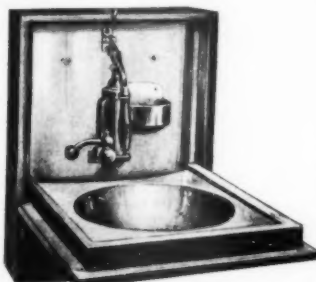


PLATE S-186

The "Arco" Folding Lavatory, N. P. copper lining, combined round basin and slab, N. P. composition pump, combination swing supply faucet, N. P. brass waste and supply couplings, oak case. Complete \$25.00

Height over all, 19 1/2 inches; width, 15 inches; depth closed, 3 1/2 inches; depth open, 16 1/2 inches; basin, 10 inches.

All Cast Bronze Heavy Pattern Combination Inlet Connection, with Strainer and Scoop.

| Size | Iron | Lead |
|---------|--------|--------|
| 1/2 in. | \$2.25 | \$2.85 |
| 3/4 in. | 2.50 | 2.90 |
| 1 in. | 3.00 | 3.40 |

PLATE S-132 1/2



PLATE S-750

Double Acting Brass "Auto" Bilge Pump. 15 inches long under spout, 5 feet rubber hose and coupling, heavy pattern.

No. 1, 1 1/4-inch diam. \$3.00

No. 2, 1 1/2-inch diam. 4.50

No. 3, 1 3/4-inch diameter, 24-inches long, with foot rest 5.50



PLATE S-1282

Polished Brass Launch Whistles. 4-in. cylinder 16 in. long.

No. 3, single tone \$7.50

No. 4, chime 7.50

No. 5, single tone 7.50

No. 6, chime 8.00



PLATE S-34

The "Knockabout" Improved Pump Water Closet, round flushing rim bowl, composition foot valve. Oak seat and cover; heavy N. P. brass post hinges. Pump rough, finished trimmings. oak seat and cover \$52.50

If mahogany seat and cover, add \$1.50

Weight: Net, 45 lbs.; Gross, 75 lbs.

This fixture is a light and compact pump water closet, especially designed for small yachts and launches where both space and weight are essential details.



PLATE S-150

The "Glenwood" Folding Lavatory, with Vitro-Adamant roll rim lipped oval basin with splash rim. N. P. copper lining, soap and brush holders, N. P. brass pump with combination swing supply faucet, N. P. brass towel rack, N. P. brass supply and waste couplings, N. P. brass trimmings. Quartered oak, polished finish \$42.50

Mahogany, polished finish, add \$1.50

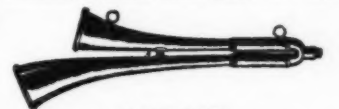


PLATE S-1285

Motor Boat Signal Two-Tone Horn with mouthpiece. Fulfills the U. S. Government requirements as signaling device for small boats. Highly-polished brass and nickel-plated. Length 10 1/4 inches.

Style "A"—Arranged with rings for fastening cord. German Silver mouthpiece. Polished Brass \$2.25

Style "B"—Arranged with bracket to screw to deck; blown through removable extension tube. Polished Brass \$2.25

Mohair Covered Rubber Extension Tube, length with mouthpiece and connection to horn \$0.75



PLATE S-1002

Round Flange Composition Monitor Air Ports, with heavy brass frame and hinge to give sufficient rigidity to prevent springing and breaking the glass.

| Diam. of Opening | Price Plain | Diam. of Opening | Price Plain |
|------------------|-------------|------------------|-------------|
| 4 in. | \$4.00 | 7 in. | \$8.75 |
| 5 in. | 5.25 | 8 in. | 10.75 |
| 6 in. | 7.00 | 9 in. | 13.00 |



PLATE S-131

The "Carlton" Brass Outlet Connection with long nipple and flanged locknut to make up on inside.

| Price | Iron | Pipe |
|-----------|--------|--------|
| 1 1/2 in. | \$1.75 | \$2.50 |
| 1 in. | 1.75 | 2.50 |
| 3/4 in. | 1.75 | 2.50 |
| 1/2 in. | 1.75 | 2.50 |



PLATE S-31A

The "Yukon" Pump Water Closet, with Vitro-Adamant oval flushing rim pedestal bowl with straight back and back outlet, oak seat and cover, high-grade composition combined supply and waste pump, self-closing foot operating supply valve, polished trimmings, pump rough. Complete as shown \$55.00

If with mahogany cover, add \$2.00

Approximate shipping weight 90 lbs.

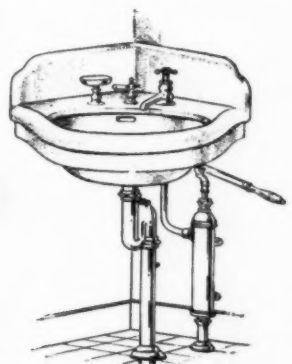


PLATE S-200A

The "Martius" Vitro-Adamant Corner Lavatory, integral back, lipped basin, "Sanos" overflow, N. P. brass supply faucet, "Rex" pop-up waste, N. P. brass trap, N. P. brass pump with supply pipe. Complete \$35.00



PLATE S-708

Brass Gasoline Pump, rosewood handle, polished faucet, special valves, 2-in. cylinder. Rough \$9.00

N. P. all 6 in. 10.50

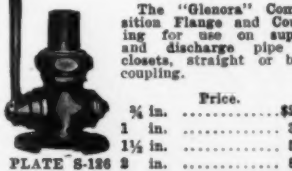


PLATE S-126

The "Glenora" Composition Flange and Coupling for use on supply and discharge pipe of closets, straight or bent coupling.

| Price | Iron | Pipe |
|-----------|--------|--------|
| 1/2 in. | \$2.25 | \$3.00 |
| 1 in. | 3.00 | 4.00 |
| 1 1/2 in. | 4.00 | 5.00 |
| 2 in. | 5.00 | 6.00 |



PLATE S-30

The "Mohawk" Pump Water Closet, round flushing rim bowl, composition combined supply and waste pump, self-closing foot valve. Oak seat and cover, heavy N. P. brass post hinges. Pump rough, with polished handle and trimmings \$70.00

If mahogany seat and cover, add \$2.00



PLATE S-52

The "Celt" Siphon Jet Water Closet, heavy Vitro-Adamant oval bowl, N. P. composition "Utilis" flush valve, controlling valve for 1 1/2" iron pipe connections, oak seat and cover, heavy N. P. brass post hinges. Brass deck plate, rubber gaskets, bolts and nuts. Complete as described \$46.00

If with mahogany seat and cover, add \$2.00

FOR USE ABOVE THE WATER LINE ONLY.



PLATE S-235

The "Ranco" Vitreous China Lavatory with "Sanos" patent overflow, N. P. brass stay with rubber stopper. Complete as described \$6.25

N. P. Compression Faucets, each 1.50

N. P. Cock Hole Cover, each .50

Smallest basin made, Length on sides, 12 in., basin, 10 in.



PLATE S-980

Low-Down Ventilators of hammered copper, seams brazed and polished all over after finishing. Made of heavy metal and fitted with high-grade cast brass polished ring, deck plate, and solid plug.

| Dia. | Hgt. | Galv. | Polished |
|------|------|---------|----------|
| 3" | 9" | \$15.00 | \$25.00 |
| 4" | 12" | 20.00 | 32.50 |
| 5" | 15" | 25.00 | 40.00 |
| 6" | 18" | 30.00 | 47.50 |
| 7" | 18" | 35.00 | 57.50 |



PLATE S-706

Brass Galley Pump, galv. iron gear, reversible and can be set at any angle.

2-inch cylinder \$8.50

2 1/2-inch cylinder \$13.50

Faucet and side outlet, add \$1.50

Complete line of closets, lavatories, portlights, deck plates, basin and galley pumps described in catalog "A" sent upon request

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SPARK PLUGS

are absolutely proof against any combination you can find in a gasoline engine cylinder; always deliver a red hot spark.

Regular Type - - - \$1.00
Magneto Type - - - 1.25

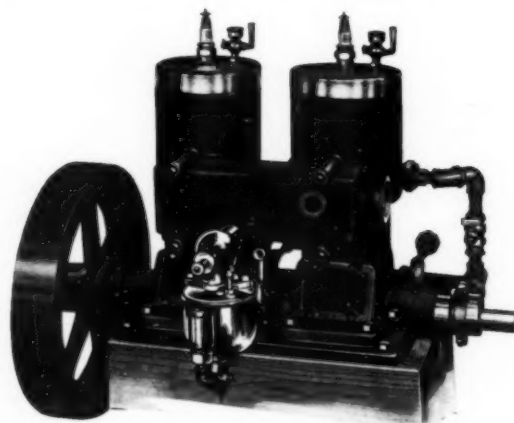
If your Dealer has none in stock, we will ship your requirements prepaid at prices quoted.

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GET A GOOD MOTOR

There's no economy in a poor one!



Champaign Bros. 2 cylinder, 5 h. p., with patent reversible propeller and whistle outfit, \$180.00.

Magneto—Bosch.

Oiling system—Compression.

Bearings—Parsons White Brass.

Cylinders, pistons, cranks and all close running parts ground and guaranteed correct to 1-1,000 of an inch.

The market does not afford better materials than are used in these motors; money won't buy better engines.

Write for FREE catalog.

CHAMPAIGN BROS., ITHACA
NEW YORK

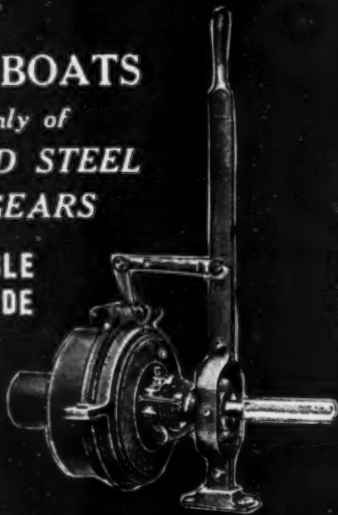
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MOTOR BOATS
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EASIEST TO
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FOUR SIZES
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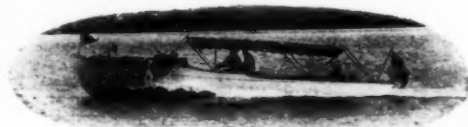
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 April 9, 1901
 Nov. 3, 1902
 Jan. 12, 1904

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GREENPOINT AVENUE

BROOKLYN, N. Y.

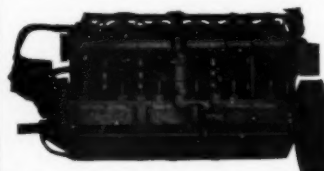


"ADVANCE" 37 ft. x 7 ft. Semi-Cruiser

This boat won first prize at Interlake Regatta, Put-in-Bay, making 20 actual miles per hour, equipped with one of our 60 to 80 H. P. high speed motors. Can furnish this outfit complete. Price upon application.

"VANBLERCK" SPEEDER, 38 ft. x 4 ft. 6 in.

Made a flying trip over Lake Erie (Detroit to Buffalo) in 11 hrs. 5 min. without a hitch, the fastest time ever made by water. Won first prize at Elks' Carnival, cup and flag, speed over 32 mi. per hr. Can do flying mile in 1.47. Equipped with two of our 60 to 80 H. P. high speed motors. See article.



"VANBLERCK'S"

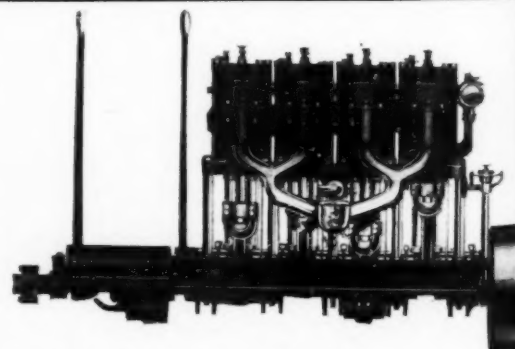
1911 Models are now ready. 2, 4 and 6 cyl., 12 to 40 H. P. 4 and 6 cyl., 40 to 80 H. P. high speed. These motors are as good as mechanics and materials can make them, and will pay you to investigate. Price is right. Write for agents' proposition.

New York Branch, Gasoline Engine Equipment Co.,
 133 Liberty Street, New York, N. Y.

VanBlerck Motor Co., Detroit, Mich.

TWO
CYCLE

MADE
IN ALL
SIZES



The Engine with a Dozen Superior Points

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VANGUARD ENGINE CO. 18 TREMONT ST.
 BOSTON, MASS., U.S.A.

ANNOUNCEMENT

WOLVERINE

MARINE MOTOR OIL

¶ We are placing on the market a line of marine motor oils known as WOLVERINE MARINE MOTOR OIL and WOLVERINE CRYSTAL OIL.

¶ The quality of these oils is the same as were the original Havoline Oils before that brand was purchased by a Western concern.

¶ The prices are also the same.

¶ As we are the sole manufacturers of this particular quality of oil, orders for them should be sent direct to us.

¶ Literature sent upon request.

WOLVERINE LUBRICANTS COMPANY
MAIN OFFICE: 80 BROAD STREET, NEW YORK

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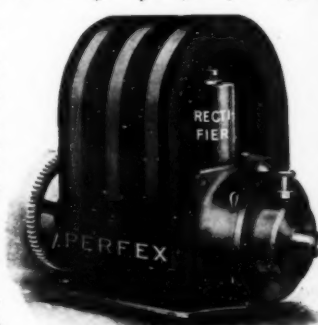
COME OUT OF THE DARKNESS

INTO THE LIGHT OF MAGNETO PROGRESS



Model A #20.
"BRANDED WITH STRIPES"

**Perfex
Rectified Magneto**



Model B #30.
"LOOK FOR THE STRIPED MAGNETS"

**The Perfex Magneto
is years ahead**

COMPARE IT WITH THE HIGH-TENSION MAGNETO FOR POWER BOAT USE

High Tension Magneto

Engine Dead with Spray or water on
Magnetos Wires or Plugs

Source of all Power-Boatists trouble

Many Parts—Delicate

Must be repaired at factory

Has complicated Distributor

Constant wear at Circuit-Breaker

Perfex "Rectified" Magneto

Engine unaffected by water in any
form on magneto, wires or plugs

Few parts—screwless construction

Never requires adjustment

Uses simple timer on engine

No wear at circuit breaker (vibrator)

*We can't tell
you half the
story here*

*Get our new
Catalog No.
110.*

Write today

The "Perfex" works with any jump-spark
ignition system. Needs no governor, starts an
engine on $\frac{1}{4}$ turn of crank. Model "A" gives
20 c. p., model "B" 30 c. p. light.

Ask Us for Full Details

Electric Goods Mfg. Co.

P. O. Box D

Canton, Mass.

The "Perfex"

NO SPARK AT
VIBRATOR

BIG SPARK AT
SPARK GAP

The Others

BIG SPARK AT
VIBRATOR

WEAK SPARK AT
SPARK GAP

Perfex Quality

LET ME TELL YOU ABOUT IT RIGHT NOW—
JUST AS IF WE WERE FACE TO FACE.

I have been so busy during the past five years proving the great benefits of Perfex water proof Power-Adding Ignition to Power-Boats for their own use, that it has never before occurred to me to emphasize "Perfex" Quality.

HOW Perfex IS MADE

1. Ignitor Shell

Tough, heat-resisting, high-insulating material. Moulds cost \$100 each. Each shell requires enormous hydraulic pressure and one hour for moulding. (The result in this case is you receive a material adapted to meet all marine conditions, even if it is very expensive for us.)

2. Induction Coil

Impregnated wood-spool, divided into six sections. Insulation between core and secondary increased as voltage rises. A winding absolutely proof against breakdown is secured as a result.

3. Condenser Box

Rubberoid case unaffected by heat, moisture or sun. Perfect fitting cover excluding moisture. "Manbridge" Patent non-puncturable condenser, hermetically sealed, in lower section. Moulds cost \$200 each. Can't tarnish nor collect verdigris.

4. Master-Vibrator

Detachable, Current Reversing, Vibrator Points do not revolve—special levelling tongue holds points always horizontal. Platinum-iridio points costing \$58 an ounce. Does away with vibrator trouble. Perfect uniformity of sparks in each cylinder.

5. Spark Plug

Detachable, fits any engine. Equipped with easily reversible "Reliance" Porcelain, which we found to be the best after exhaustive tests. Costs us 50% more than we can buy complete spark plugs of inferior type. Soot-, water-, and oil-proof.

Combined with the "Perfex" Rectified Magneto, Perfex Ignition forms the ONLY RATIONAL and PROVEN WATERPROOF MAGNETO HIGH-TENSION IGNITION SYSTEM.

HOW IT MIGHT BE MADE

1. Ignitor Shell

Of brass tubing, 17 cents a lb. Cut off hundreds at a time in an automatic screw machine. Threaded brass cover. Very inexpensive. (In this case the result is: that you get a material that will tarnish and collect verdigris. The ignitor will get unbearably hot and if left idle near salt water its cover will soon become irremovable.)

2. Induction Coil

Secondary wound upon primary like spool cotton (liable to short-circuit). Coil made removable, giving you the delay and expense, and us the profits on frequent renewals.

3. Condenser Box

Round Brass tubing at 17 cents a lb. Made on screw machine. No expense for tools. Tinfoil condenser made removable so we could make a profit while you had the expense and delay on repeated renewals.

4. Vibrator ON EACH CYLINDER OR POOR MASTER VIBRATOR

Non-detachable, do not permit reversing of current—impossible to keep points adjusted—constant vibrator trouble, no uniformity of sparks. Cheap points.

5. Spark Plug

Inferior variety, liable to short-circuit from oil and soot, inexpensive. Not waterproof. Constant source of trouble.

WRITE TODAY FOR
CATALOG No. 100

ASK FOR CATALOG

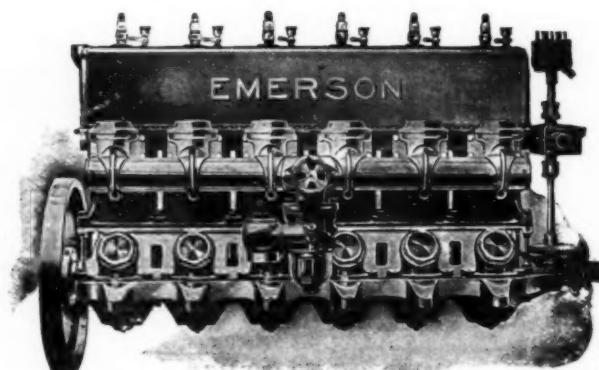
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Avoid clumsy unproven imitations.
The best is the cheapest in the end.
H. C. Thomson & Co. Mfg.

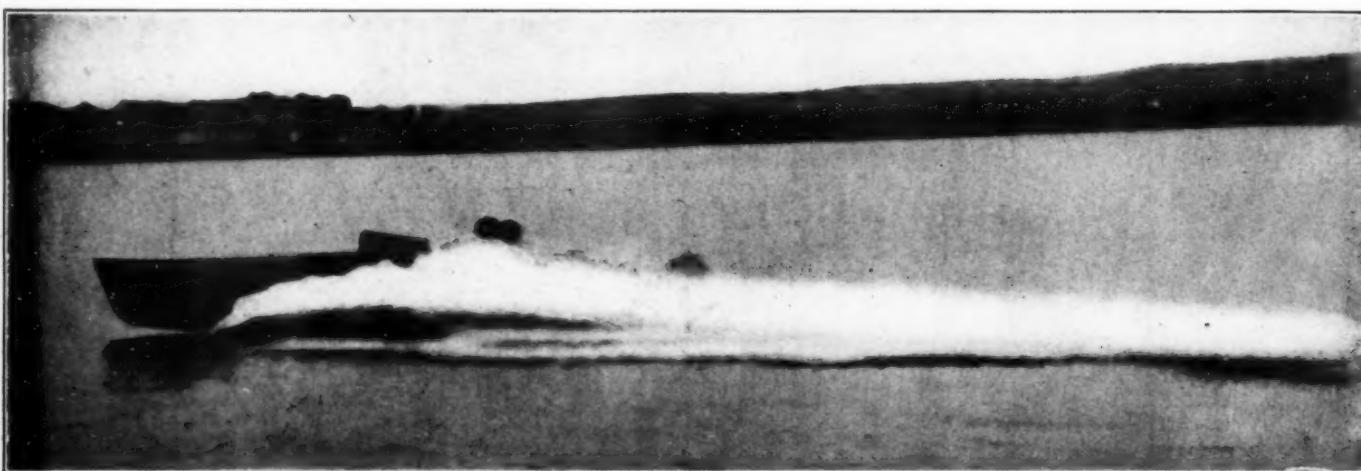
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Boston Office 156 Purchase St. PO Box 512
CANTON, Mass.

World's Records and Performances of the EMERSON ENGINES

THESE engines are built by workmen most of whom were selected from the United States Gun Factory at Washington, with special machinery that insures a great accuracy; steels of exceptionally high tensile strength and toughness are employed wherever possible, even the fly-wheel centers are of high carbon saw-plate ground and oil-tempered to insure great strength and lightness. The crank-shaft has over thirty inches of bearing surface to insure against frequent adjustment. The engine is practically finished all over, the composition base is scraped all over and the copper jackets, manifolds and inspection plates highly polished, making the most attractive engine ever constructed. Our exceptional facilities enable us to give the quality and power at the right price while our design provides for eliminating the unnecessary weights of cast iron, heretofore necessary in engine construction. With this engine a light weight boat can be constructed that is seaworthy and with a surplus strength to carry the motor, at from \$200 to \$400 that will, with a certainty, far surpass in speed and comfort any boat carrying a heavy motor with a necessarily proportionately heavy boat regardless of power or cost. With our engine, the moving parts being light and strong, eliminates the disagreeable vibration produced by heavy motors. The following results show that no engine of any make has ever before been able to produce such marvelous speed and endurance as the "Emerson" and, in ten days' racing, in competition with the fastest boats in existence, has won more important races, carrying with them cash prizes and valuable trophies, than all the rest of the various makes of engines combined.



Emerson Six Cylinder Racing Engine
100-125 H. P. Weight 300 pounds



"Emerson" World's Twenty-six-foot Champion, 36.1 Miles per Hour at Washington, D. C., August 20, 1910.

Winner 26-foot free-for-all championship Western Power Boat Association.
Winner 32-foot free-for-all championship Western Power Boat Association.
Winner 40-foot free-for-all championship Western Power Boat Association.
Winner Blue Pennant given by "Motor Boat" for Western Speed Championship.
Winner Carpenter Cup representing Speed Championship, Hudson River Yacht Racing Association.
Winner Lukenheimer Trophy, Ohio Valley Carnival.
Winner Corinthian Yacht Club Trophy, Speed Championship, Potomac River.
Winner Marshall Hall Trophy for speed championship.

Holder of World's Record for 26-foot displacement boats in competition surpassing in speed the records of such well-known boats as Independence, champion of W. P. B. A., 1908; Hoosier Boy, champion W. P. B. A., 1909; Red Top II, champion of Mississippi Valley 1910; Scripps, Mascot, Comet, Disturber, M. V. II, Syracuse, Eldredge V, Gun Fire II, Elmer L., or any other boat that has ever raced on the courses of the Mississippi Valley, Western Power Boat or Hudson River Yacht Racing Associations many of which were equipped with engines of from two to six times the cylinder area of the Emerson's engine. In all of her races this boat has carried two heavy men, weighing over 185 pounds each, and her hull is substantial, strong and seaworthy, weighing over 600 pounds and is not a racing freak. The above performances have been made possible by our new four-port system, 300 pound engine, far surpassing any motor ever built for workmanship, finish, design, or power to pounds of engine weight.

Write for Catalog to-day

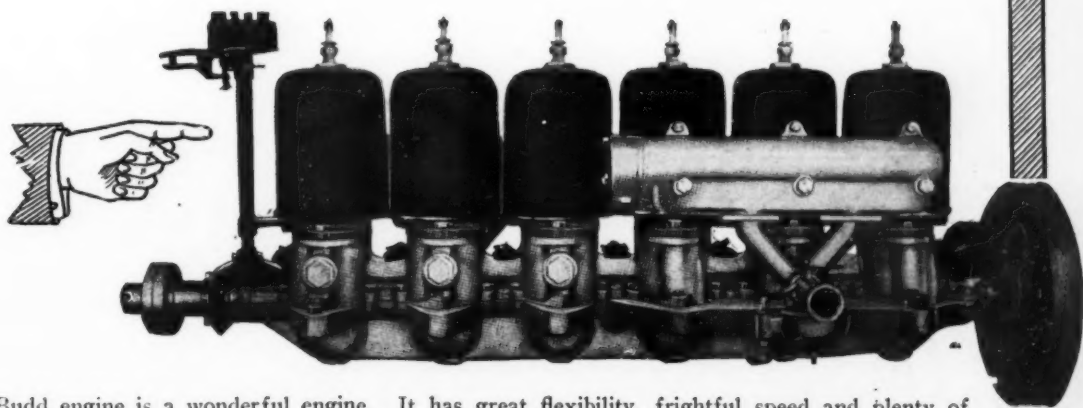
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EMERSON ENGINE COMPANY (Inc.)

ALEXANDRIA, VA., U. S. A.

NEW YORK OFFICE: 1737 BROADWAY

A Red Hot Power Proposition



THIS latest Pierce-Budd engine is a wonderful engine. It has great flexibility, frightful speed and plenty of power. Owners have installed these motors in speed boats, runabouts, auxiliaries, tenders and pleasure launches. Universal satisfaction is the result. A working speed as high as fifteen hundred revolutions is easily secured in speed boats, and engine speeds (under load) have been taken at much over two thousand revolutions per minute. Any engine which will withstand this TREMENDOUS SPEED can be depended upon to *run and run and run* at ordinary speed with no signs of wear and NO TROUBLES. OUR BEAUTIFULLY FINISHED POWER ENGINES HAVE won race after race, proving that a "good looking" engine can also be a "good working" engine. There is NO SALES TALK in our new catalog. It tells mechanical facts. Any man can have a copy if he is a boating enthusiast. Any interested man will want to read this catalog. It will *not* urge you to purchase an engine, it will *not* place you under any obligations. It will merely *INFORM YOU ENGINEWISE*:

These Engines Are Years Ahead Of All Others

THERE are enough new features about these engines of ours to attract the attention of the worst "crank" and enough GOOD features (exclusive) to convince any reasonable man that this is the engine for him. We prefer to do business through agents, but for the present will take care of unallotted territory from our factory offices. Our expert will be pleased to personally cover "your" case if you send the lines of your boat or sufficient information so we can make a POWER AND SPEED GUARANTEE. Do not wait. WRITE TODAY FOR OUR COMPLIMENTARY FREE POWER-ENGINE BOOK.

Pierce - Budd Company
Dept C. Bay City, Michigan



HOLLIDAY MARINE MOTORS

owe their reputation for long, steady service to correct design and skillful workmanship. All materials used are absolutely the best for the purpose. Holliday ratings are conservative and they develop full rated horse-power at low speeds. The Holliday is the quality motor and has thousands of enthusiastic users. It has stood the test of roughest usage.

Made in 1, 2 or 4 cylinders—2½ to 40 horse-power. 4-cycle principle and jump-spark ignition.

We want agents. 1911 territory now being assigned. Write for proposition.

HOLLIDAY ENGINEERING CO.
751 Bunker Street, :: :: CHICAGO, Ill.

Established 1891



HAND V-BOTTOM BOATS

WE have made arrangements with Designer Hand whereby we will build the most successful of his well-known V-bottom boats and will furnish them in all stages of completion (plans, patterns, knock-downs and complete boats), and at prices only made possible by modern systems, a new and original method of construction, and by building in large quantities. Write for Circular G.

FACTS:

The V-type produces as good sea boats as are built. "V-bottoms" never "pound."

The design was developed on rough bodies of salt water.

The boats will give satisfaction anywhere.

There is no faster type built, hydroplanes excepted.

The construction is stronger and more rigid than any other type now built.

All details are very simple. Hundreds of these boats have been built successfully by amateurs in all parts of the world. Ask the man who uses one.

I. P. DOYLE CO., Concourse, Hudson Terminal Bldg., N. Y. Representatives

They will gladly show you their V-Bottom

18ft. Knock Down assembled before shipping.



Note flat Wake of Regular Hand "V-Bottom."
Also Heel towards inside of turn.

Bath Marine Construction Company

Bath, Maine

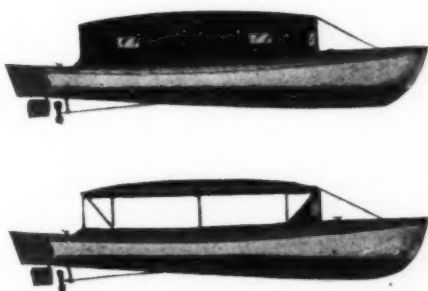
Henry Douglas Bacon, Pres. and Gen. Mgr.





THE TRADE NAME

that stands for the best in Motor Boat Tops, Life Preserving Cushions, Take Down Houses, and Take Down Garages. Send for our complete Kenyon Catalogue which illustrates, describes and gives the prices of the Kenyon products.

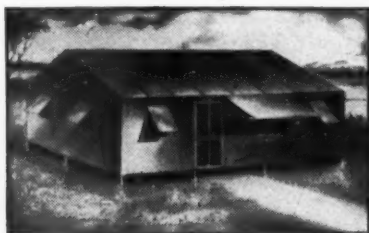


Kenyon Tops, Cushions, Cockpit Covers, etc., give greater value at a lower price than any similar articles made. The fact that they are patented prevents them from being imitated. Insist that your boat builder furnishes Kenyon Goods.

The Kenyon Life Preserving Pillow is guaranteed to pass every requirement of the new law allowing The Kenyon Cushion to be used in pleasure boats under 65 feet in length. For \$1.50 each, express charges prepaid where there are no Kenyon dealers, we will send you a beautiful individual Life Preserver Cushion.



is an absolutely portable building capable of being erected in a few hours, so light weight that it can be transported long distances without inconvenience. Sanitary, absolutely weather-proof and guaranteed for three years' service. Made in sizes of from one to five rooms and also in garages for every size of automobile. One half the price of any other portable



building, can be erected in one tenth the time and weighs less than half. Catalog and beautiful colored illustrations sent FREE on request by using the accompanying coupon.

R. L. KENYON CO.
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Gentlemen:—

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SINTZ REVERSING PROPELLERS

**As Strong as a Solid Wheel
As Speedy as a Speed Wheel**



**More Perfect Control than is
Possible with any Other Device**



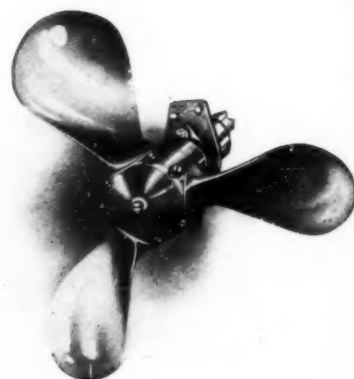
**SINTZ REVERSING
SPEED WHEEL**

**'Not on the Way
IT'S HERE**

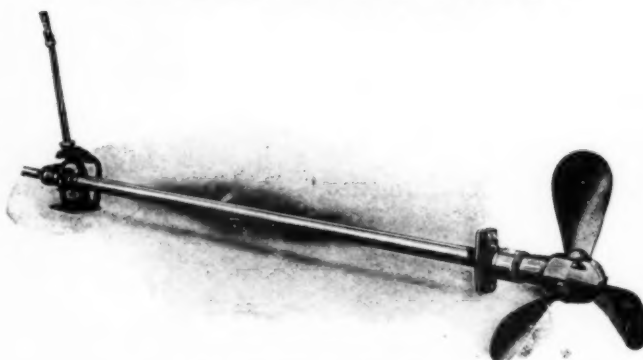
**Not Only for Small Boats
IT'S FOR ALL BOATS**

Canoe—Tug—Cruiser—Racer

**Not an Experiment
A Tried and Proven Success**



No solid speed wheel has ever equaled a Sintz Speed Wheel and it has been tried out in competition with all of them. The nearest they ever came was on a 100 H. P. Scripps Motor, in a 32-mile Speed Boat, and then they were a quarter a mile an hour to the bad.



A COMPLETE SINTZ OUTFIT

A Heavy-Duty Sintz always outclasses competition for a Tug or Tow Boat. Our adjustable pitch makes our wheel adapted to any tow, no matter whether it is a light sail boat or heavy stone barge. You cannot overpower the Sintz Reversing Propeller.

The Sintz has all the advantages of a reverse gear, with none of its weak points. There are no obstructions to catch weeds or debris. The blades cannot come off or be unlocked without removing the shell cap. Every part of the mechanism is stronger than the propeller shaft. It is suitable for from 1 to 300 H. P. in Canoe or Tug, Cruiser or Racing Boat. Now why order a wheel that only meets part of your needs? Every motor manufacturer will furnish a Sintz. *Insist on a Sintz* with your new motor or boat. Thousands of catalogues now ready. Send for a copy. We pay Uncle Sam for the privilege of mailing it to you. Last month's business doubled that of a year ago. Join the wise ones now.

EASTERN MOTOR SALES CO., 1680 Broadway, New York, N. Y.

Eastern Agents

WILMARTH & MORMAN CO.
617 Canal St., GRAND RAPIDS, MICH.

MOTOR BOATING

REYNOLDS

ROTARY VALVE MOTORS

EVERY man who has ever gone in for the sport of motor boating has found, before the end of his first season, that his enjoyment has been absolutely measured by the performance of his motor. In the **Reynolds** we have developed a combination of qualities, which will go straight to the heart of every man who has had experience with cranky, noisy, unreliable engines.

Check up the following points, and see if they do not correspond with your idea of what an ideal motor should embody:

☐ It should be **simple**, and free from the annoyance of frequent adjustments and repairs:

☐ It should be **sturdily built**, of the highest grade of materials, with generous bearings to withstand the constant and heavy service loads which are put upon every boat motor.

☐ It should be **thoroughly reliable** under all the varying circumstances which are bound to arise—and should be so, not only from the standpoint of avoidance of unpleasant labor, but for the personal safety of the operator and all those who may share the hospitality of his boat.

☐ And to be a **real** source of pleasure and pride, it should be **quiet** in operation and free from vibration.

THE REYNOLDS ROTARY VALVE FOUR CYCLE MOTOR

In this new type we offer a splendidly designed and constructed machine, in which the ideal conditions outlined above have so obviously been accomplished as to make a vital appeal to every man who **knows** a gas engine when he sees it.

The poppet valve mechanism has been entirely eliminated and there is not a spring of any kind, a cam, or a push rod in the motor. A simple, sturdy, spiral gear drive has been substituted with no moving parts exposed, except the flywheel. All parts are finished in specially designed jigs, insuring absolute accuracy and interchangeability, and the materials and workmanship employed are the finest that can be had at any cost. All this might seem to indicate a high price, but when you come to investigate, you will find that for what we give our price is exceedingly moderate.

It is **very little** more expensive to make things absolutely right, while you are making them, but this **very little** means all the difference between satisfactory and unsatisfactory service.

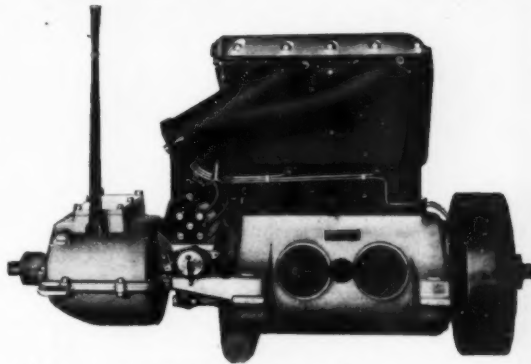
It is our ambition to have every user not only satisfied, but an ardent enthusiast in our cause.

We ask that when you write, you give us some idea of what your requirements for power will be—this will enable us to give you a more intelligent reply and perhaps to make some valuable suggestions.

REPRESENTATIVES

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| Greater New York: H. C. CUSHING, JR., Pulitzer Bldg., New York City | New England States: ARTHUR P. HOMER, 88 Broad Street, Boston | Philadelphia Territory: CARMAN & BOWES, Bourse Bldg., Philadelphia | Ontario and Western Quebec: MARINE CONSTRUCTION CO., Toronto |
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REYNOLDS MOTOR COMPANY
No. 200 Hillger Avenue :: :: :: Detroit



4 Cylinder 4 Cycle 15-20 H. P.





1911 Eagle Engines

More Profits and How to Get Them

IN these days of superlative description and inflated values, we appreciate the difficulty we experienced for some years in convincing the Trade that the profit in selling engines was not by selling a cheap engine, but one that brought them a satisfied customer. Cheap engines have had their day. The public has become wise. There are, however, a few people in the world who attempt to get something for nothing. They always fail, always have and always will. You must appreciate that it is impossible to secure a good engine, one that will give you satisfactory service, without paying a fair and reasonable price for it—a price that will recompense the manufacturer for his material and efforts, and a sufficient compensation for the dealer for his service.

If there ever was an opportune time to purchase an engine with a good reputation, now is that time. Eagle engines for 1911 are so good, the prices are so low (considering their quality) that you cannot lose a sale if you can show one to a prospective buyer. Further, the line is so complete with such a variety of sizes that no one is obliged to select an engine that might or might not exactly meet his requirements. You will find in our line an engine that will be suitable in every way, and in every type of boat from 12 to 50 feet in length.

We have had considerable to say relative to our extensive variety of models. We not only meet the requirements of the present type of pleasure craft and speed boats, but we also have a most complete line of heavy duty engines for working boats. There is no other manufacturer of two cycle engines who offers such an extensive line

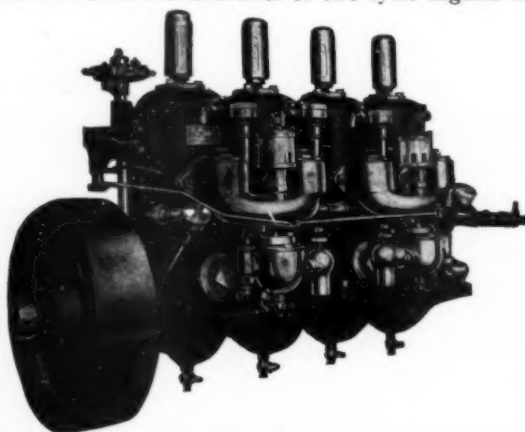


Illustration of our Semi-Speed Models. Made in 2 Sizes and 8 Models—1, 2, 3, 4 Cylinders; $3\frac{3}{4}$ in. Bore, 4 Stroke and $4\frac{1}{2}$ in. Bore, 5 Stroke. They develop their Horse Power Ratings.

as we do in both the semi-speed and heavy duty models. The fact that a line so complete can be purchased from one manufacturer tends to concentrate your business, insures you of better service, increases your volume, and eventually makes your business more satisfactory and acceptable.

It has always been our policy to offer more for the money invested than it is possible to get anywhere at the same price. We do this, not from the fact that we have any particular advantage over others, EXCEPT, as we apply it to organization, capital investment, and engineering ability.

During the year 1910 we inaugurated a campaign of education relative to high grade equipment with each engine. For many years the equipments that were supplied with most engines consisted of a screwdriver, cheap propeller, poor ignition outfits, cheap batteries, etc., thus enabling the price on engines and equipment to be catalogued at a low list price, handicapping the manufacturer who supplied a high grade equipment, and had in mind fair treatment to his customer. Our campaign has borne fruit. During a recent exhibition of engines the quality of equipment shown was a great improvement, but upon inquiry we found a desire to get an extra price for the same grade of equipment as we supply with each engine, and you will be asked to pay an advanced price unless you insist on having your equipment such as we supply at the lowest list price and which we furnish at the price as shown in our catalog.

We have always maintained that nothing could be saved by using a cheap equipment with an engine. The requirements are such that the best supplies obtainable should be a part of each engine equipment. You will find by reference to our catalog that we furnish only one grade. But stop there. Read what we supply, and from the standpoint of modern practice every article is the best and highest grade obtainable.

There is character in engines just as there is in men. We learn to know them by the same standards that we apply to people. We recognize the value of goods by appearance, quality of material, workmanship, efficiency and frequently by something else—*Their name*—which represents in concrete form the character, quality and fitness of the maker. The word "EAGLE" on a marine engine is assurance that they represent the best there is in Marine Engines from every point of view.

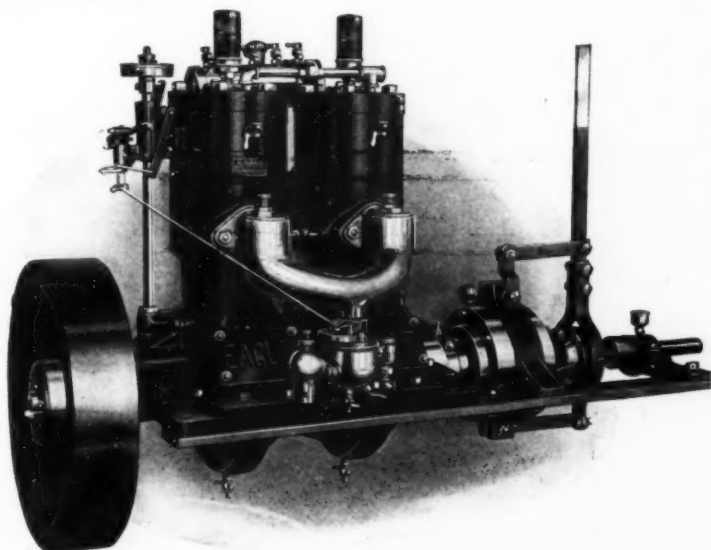




1911 Eagle Engines

The Engine You Have Been Waiting For
The BEST From Every Point of View

Eagle Engines are the most highly developed engines so far as design, finish, workmanship and quality are concerned so far produced. They can be bought at prices that will amaze you.



A most complete nest of Heavy Duty Eagles, with a 12-year reputation for Efficiency—our catalog, which is free, tells you all about them.

Why not place your engine business on the same basis you do your other requirements. You perhaps have a preference in hats, clothes, shoes, etc. You usually make purchases of these lines from year to year from people who command your trade by having met your requirements satisfactorily, and in whom you have confidence. The engine business is possible under the same conditions. Become associated with a manufacturer who has the capital, facilities, necessary for meeting your demands, one that is firmly established and has been for years, and considers the engine business a permanent business. Do not lose sight of the many changes that have taken place in this industry. There are a limited number of manufacturers who have made a success of manufacturing engines. Care should be exercised in forming new associations in this respect, but when it is possible to arrange with a reputable manufacturer, *seize it*, as you will make no mistake, and results we are sure will be mutually satisfactory.

Eagle engines are the last word in engine construction. They are distinguished by a rarer degree of elegance. They are of such design and construction that you will not find their equal.

Secure a copy of our new catalog, it is free merely for the asking, and really it is worth your time to make the request. You will find a great amount of information that will interest you, and take our word that it is nicely printed and handsomely illustrated.

THE EAGLE CO., 98 Warren Street, NEWARK, N. J

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Be fair to yourself. Send for the book that tells.

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"The gear
to bear
the wear
and tear"



Responds Like
"A Thing of
Life"

—this Doman Motor—because the highest skilled intelligence is embodied in its construction. (Listen.) Scores have disappointed themselves because they failed to look far enough in seeking out a trustworthy motor. Now, don't—for the sake of your own peace and pleasure—don't buy a power-plant for your boat till you've investigated the

The DOMAN
MARINE MOTOR

**20 H.P.
Heavy Duty
Marine Motor**

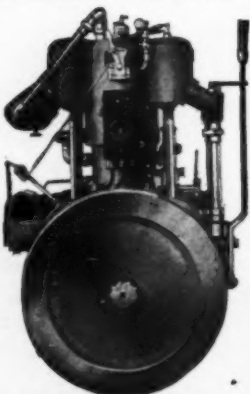
It's compact, strong, perfectly balanced; every working part accessible; so simple that a greenhorn can soon run it acceptably by our printed directions.

It is a four-cycle, two-cylinder, 20 H. P. (and you really get 20 H. P., too) engine. We've told all about it in a catalog and folder which we'll send you free.

We have other motors, 5, 8, 10, 15, 20, 30, 45, 55 H. P., for both medium and heavy duty. Write us your wants today.

The H. C. Doman Co.

DEPT. C.
Oshkosh, Wis., U.S.A.



A Life Saver

A Money Saver

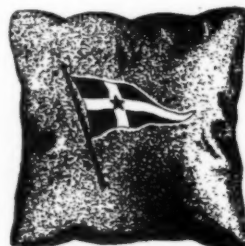
Hopkins

Life Preserver Cushion

will keep you

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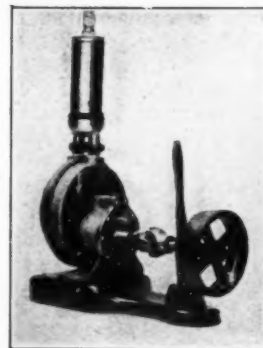
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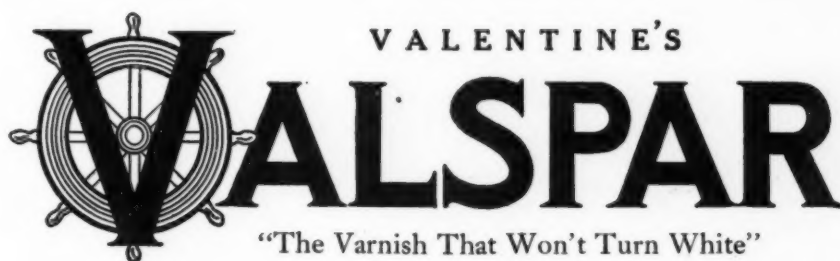


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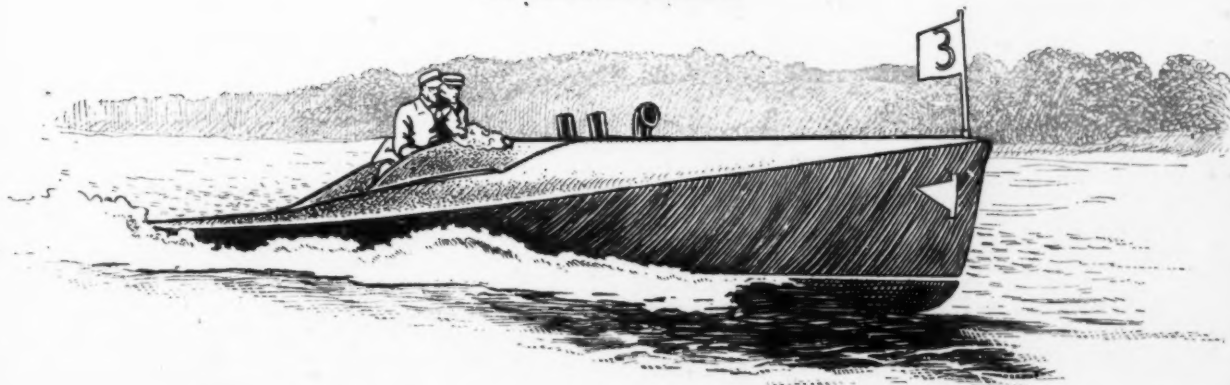
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TO the inexperienced, all marine engines look pretty much alike, just as all oranges are sweet to the eyes of a child. You know that on the uniformity sun-turned cheek of the orange are signs that betray its *real* quality. So it is with the engine. First among the important points of engine-building is design. It is the soul of the machine. Minor imperfections may be altered, but if the designer's ideal was at fault, the engine will never do its work as it should.

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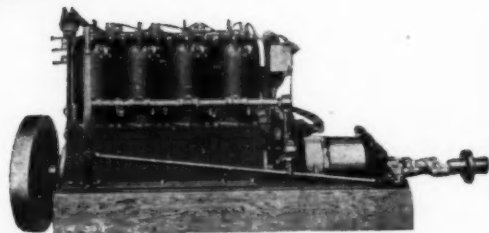


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CRANK CASE—Large hand-hole plates, end disk removable.

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REVERSE CLUTCH—Planetary type. Direct cone drive ahead; for reverse gears in action, gears steel on bronze pinions; encased in oil; same speed astern as ahead. Only two adjustments. Control led to forward end of motor.

IGNITION—Jump spark; Splitdorf or Bosch Magneto, when specified; controls led to forward part of motor.

CYLINDER HEADS—Removable; valve caps polished brass.

CRANK-SHAFT—One-piece open hearth steel, milled, turned and ground; fly-wheel end tapered.

LUBRICATION—Positive mechanical oiler, driven by ratchet from cam-shaft; oil carried to each wearing part; centrifugal oil rings used on crank shaft.

PISTONS AND RINGS—Trunk pattern; 3 rings on medium duty type; 5 rings heavy duty type; ground.

INTAKE BRANCHES—Give a direct and easy flow of gas; fitted with hand-hole plates.

CARBURETER—Schebler; controls led to forward part of motor; hot-air intake.

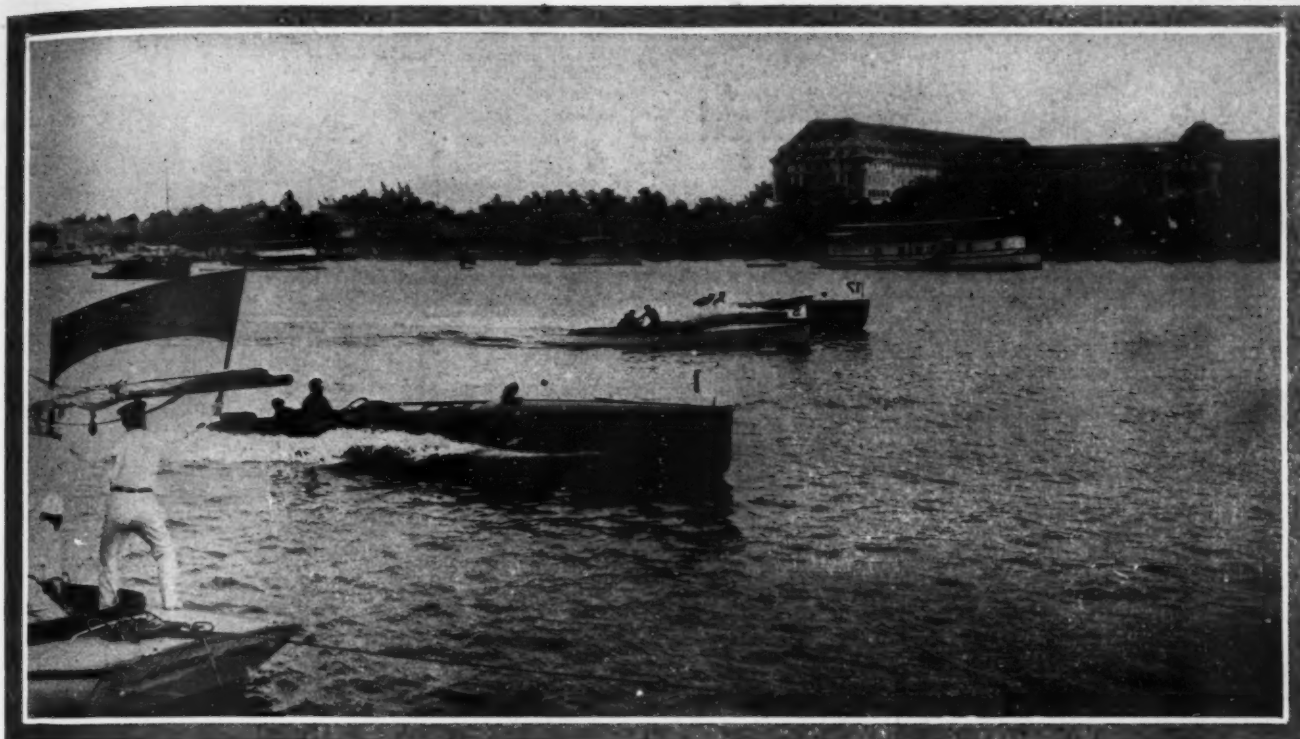
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Ace II, Diana and T & S crossing the line in the nine mile handicap of the first day.

The Palm Beach Regatta.

An Account of the Four Days of Motor Boat Racing, the Seventh Annual Lake Worth Meet.
T & S the Winner of the Palm Beach Grand Prize and Something About the Other Boats.

THE climax of the motor boating activity on Lake Worth, and the first event of the season of national interest, was the Palm Beach Regatta, from March 14th to 17th, inclusive, the seventh annual event of the Palm Beach Power Boat Association. Several of the last year's boats were seen again this year, but the majority of those entered, and all of them that really did things, were new boats. T & S, a 32-foot Florida-built boat, owned by W. F. Coachman, of Jacksonville, and equipped with a 100-h.p. Sterling engine, landed a purse of \$3,000, one of the largest cash prizes ever awarded a motor boat. She ran the 119.19 statute miles of the endurance contest in 4 hrs. 11 min. and 17½ sec. The other winners were Ace II, a 32-footer equipped with a 100-horse Sterling, owned by W. W. Trimpi of Newark, and built by the Leyare Boat Works; Ruth K, a 32-footer equipped with a 30-35-horse Sterling, owned by C. S. Smiley, Clarksburg, W. Va., and built by George Elliott of Buffalo; Suelo, the 24-footer equipped with an 18-25-horse Sterling, owned by James K. Clarke, of Philadelphia, and built by J. Vanderslice, Camden, N. J.; Kuleoff, owned by K. C. Goodwin and equipped with a Roberts motor; Dewey, owned by W. F. Coachman, and Victor, owned by G. F. Paddison of the Eau Gallie Yacht Club and equipped with a Loew Victor.

Tuesday, March 14th.—The speed-record trial for the best average of 6 laps of a one-mile course and for the Palm Beach Cup, was won by Ace II at an average speed of 27.01 knots. T & S took second place, with an average speed of 24.03 knots. In the speed contest for Florida-designed and constructed boats, T & S was the winner, her elapsed time for the 9-mile course being 21 min. 55½ sec.; Dewey was second.

The 9-mile handicap for all boats under the A. P. B. A. rating rules was won by Ruth K in 33 min. 31½ sec.; Ace II was 6 seconds behind the winner and T & S came in third. In this race Vita, owned by J. Stewart Blackton of New York, was disqualified for prematurely crossing the line. Florida Cracker, Mr. Geo. Gingrass' new boat, burnt out her bearings shortly before the race, and could not enter.

Wednesday, March 15th.—T & S won the honors in the second day's races, taking the 18-mile event and also 4½-mile race for boats of 32 ft. and over. Kuleoff won in the 4½-mile contest for all boats, and Suelo was the winner of the boats under 32 ft., over the same course.

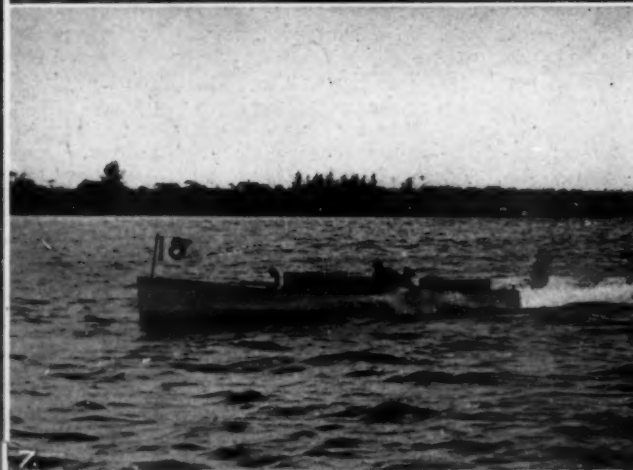
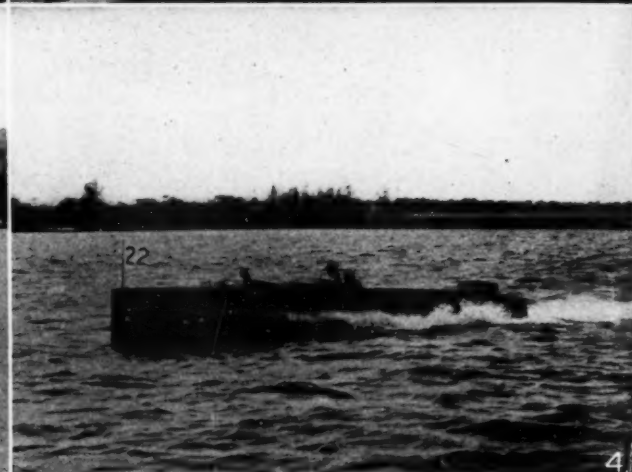
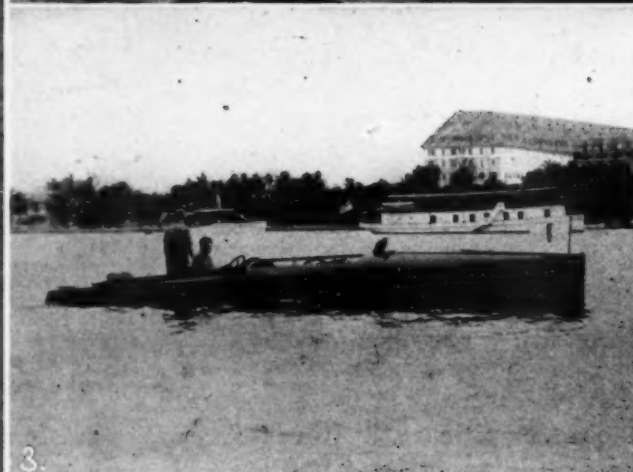
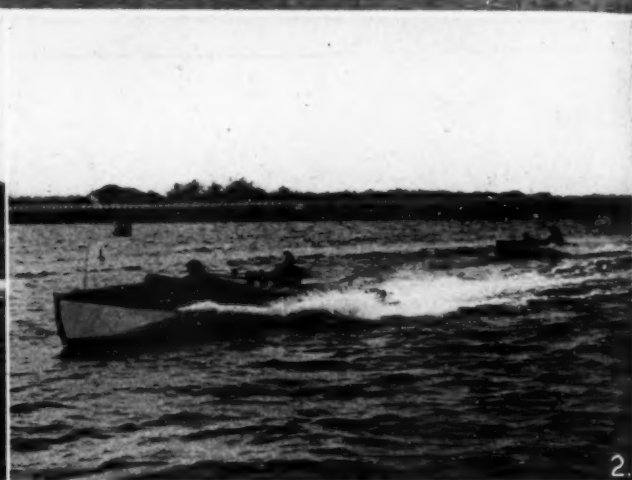
In the 18-mile race Suelo would have won if the judges had not penalized her for exceeding her handicap. Diana broke a connecting rod, and was out of the morning race, and although she started in the 18-mile event, was too heavily handicapped to make any showing. Florida Cracker made her first trial run in the afternoon, and although her 100-horse Emerson drove her at very high speed, she was hardly tuned up in racing trim.

Thursday, March 16th.—The heavy northeast gale kicked up quite a sea on Thursday, and the racing was under the worst possible conditions. There was much ignition trouble caused by short circuiting, and more than half the entries were put out of commission.

Kuleoff won the first race for boats under 17 miles speed, with Bill second. The race for boats of over 17 miles speed was won by T & S, with Ace II in second place. The contest for all boats of over 12 miles speed, over a nine-mile course was won by Dewey; the fourth race, over a 4½-mile course, was won by Ruth K; Dewey won the 13½-mile race.

Friday, March 17th.—The biggest event of the regatta was the 103.5-mile endurance contest for all boats of a speed above 20 miles per hour. T & S won the Palm Beach Grand Prize for this event, running the course in 4 hrs. 11 min. and 17½ sec. She ran without a falter for over 4 hours, during which time every other contesting boat had trouble and withdrew. Dewey, another Coachman boat lasted the longest, but went dead at the beginning of the 22d lap, when 15 minutes more would have given her the second prize, which was not awarded. The other boats starting were Vita, Ace II, Dewey and Diana. Ace II started from scratch and performed well for 4 rounds, when she experienced trouble with her carburetor and was forced to withdraw. Vita, a hydroplane, started like a shot, but in making the first turn at full speed was unable to keep to the course and ran aground. Dewey was several times in trouble and lost 21 minutes through the breaking of her tiller lines. Diana failed to start until an hour and 49 minutes after her time, but even so, might have won second prize if she had not be short-circuited by flying spray.

The closing event of the regatta was a consolation race open to all boats not already having won prizes. The first prize in this event went to Victor, the second prize was won by Jack Rabbit, with Dorothy D winner of the third prize.



A number of the principal performers in the seventh annual Lake Worth regatta.

1—Bill, owned by A. W. Brown; 2—Dewey and Jack Rabbit, owned by W. F. Coachman and W. A. McDuff, respectively; 3—Ace II, the new 32-footer, owned by W. W. Trimpi; 4—Ruth I., owned by C. S. Smiley; 5—Suelo, owned by James K. Clarke; 6—Dorothy D., owned by Payne Whitney; 7—Victor, owned by G. F. Padison; 8—Vixen, owned by J. Stewart Blackton.

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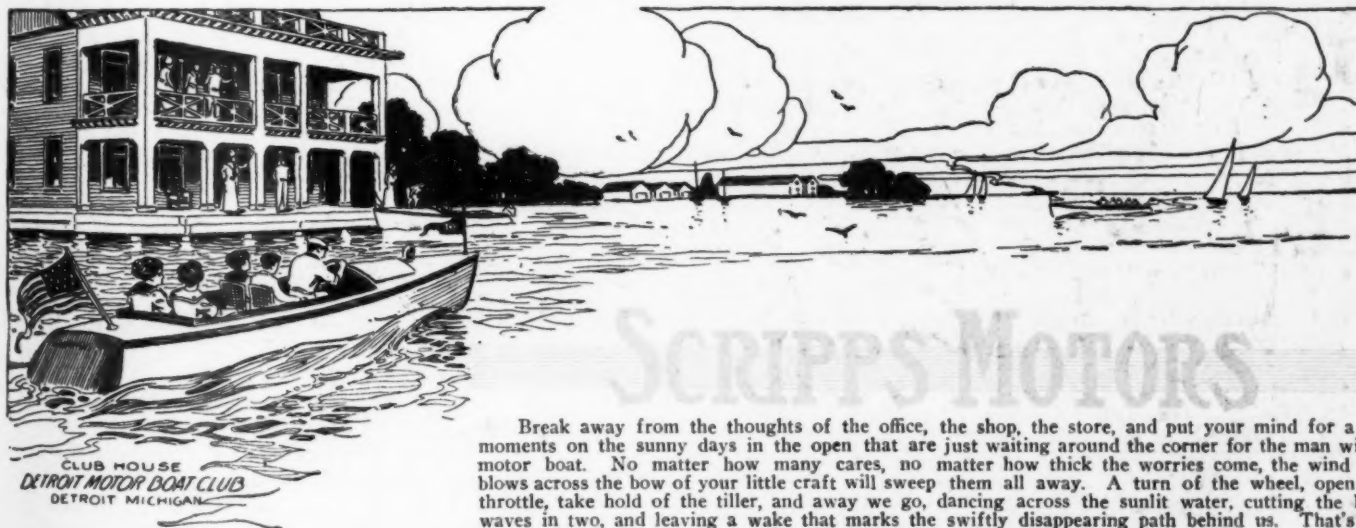
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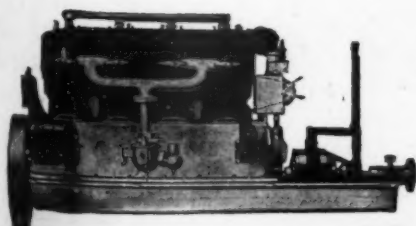
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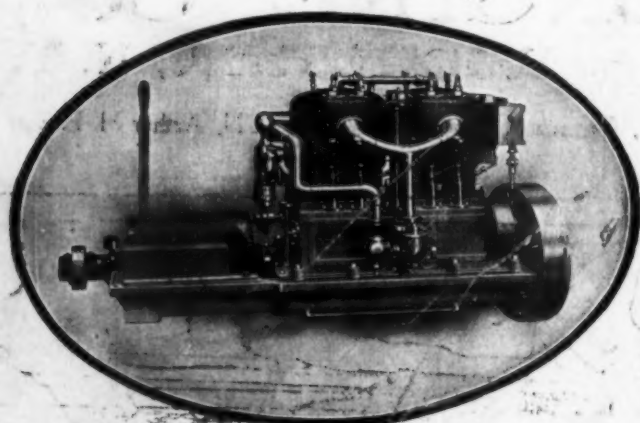
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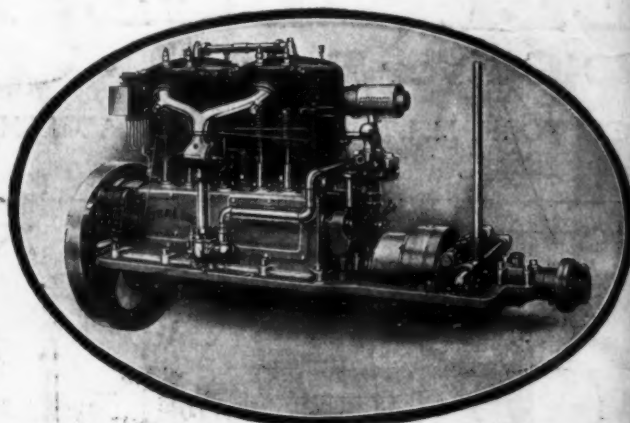
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